



# RM-Resilient Rural Society, Polity and Entrepreneurship

First Edition



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# About the Book

To understand India's culture it is important to understand the rural society. Modernisation and Westernisation of the Indian society can be linked to its colonial history. When the East India Company arrived to trade in India around 1757 and began to take over administration, India was still ruled by the kings and princes and was in medieval ages. At this point of history, the west had started industrialising and their governments had also started to become democratic. With industrialisation, urbanisation also came about in the west.

After independence from colonial rule in the 1940s, India had 86% rural population and the government took charge of setting up industries because the economy was not modernised and could not have competed with its western markets. In this process, as many critics of the post-colonial industrial policy have pointed out, the growth of the agriculture sector was left behind. Green Revolution came to India in early 1960s and made the country self-sufficient in terms of food production. Later, the White Revolution, also called the Operation Flood was launched in 1970s and improved dairy production. Rural societies in India are now moving towards modernisation with innovation in agricultural practices. But at the same time, these societies uphold the traditional cultural values.

Disasters are often seen as "large-scale, stressful and traumatic events" (Dominici *et al.*, 2005). They result in extensive damage to public, property, network and transport, and also to natural resources. The outcomes are tragic leaving many deaths and injuries and severe disruption to the common lives. These effects disrupt socio-economical, cultural, and even political settings, of the society thereby obstructing the growth and progress of the society for a considerable period by destroying years of development in minutes. For instance, the Indian Ocean tsunami which occurred in 2004, collapsed 20 years of development of Maldives, a beautiful island which is located southwest to India and Sri Lanka.

Some key concepts like hazard, disaster, vulnerability, resilience, and risks are first discussed and defined. This is followed by the classification of disasters. Various kinds of disasters namely, geological disasters, hydro-meteorological disasters, biological disasters and man-made disasters are explained briefly. The Chapter ends with an explanation on global disaster trends and emerging risks of disasters with a note on climate change and urban disasters. Topics explained in the introductory chapter would help in understanding the topics discussed in further chapters.

Societies the world over face complex challenges today. The proliferation of capitalism has led to significant disparities in wealth. It has also led to indiscriminate use and often abuse of natural resources, which is causing pollution and leading to global warming. Leaders of all hues have called for corporations to be more socially responsible. The call is being answered through entrepreneurship that is aimed at being sustainable in an economic sense while not trying to maximize profits, by civil society organizations and non-governmental organizations that call for more equality, and by corporations themselves becoming more responsible through corporate social responsibility activities.

Our approach has been to bring a mix of theory and practice in the book. The book refers to wide range of literature to build the concepts. In order to encourage thinking and application, hands-on activities have been included. Each Chapter first provides an overview



and then delves deeper into the concepts. Wherever appropriate and possible, explanations have been provided in tabular and pictographic manner.

This book represents the collective efforts of so many remarkable individuals. I would like to thank the contributors to this volume for their collective wisdom, experience and insight. We would like to thank our Subject authors: Dr Ravi Dhanuka, Co-Founder and Director, I-Saksham Education and Learning Foundation, New Delhi; Dr Priyadarashini Vasamsetti, PhD Scholar, HCU, Hyderabad; Prof Prakash Satyavageeswaran, Assistant Professor, IIM Udaipur; and Prof DVR Seshadri, Clinical Professor of Business in Marketing, ISB, Hyderabad.

I would like to thank our MGNCRE Team Members for extending support in completion of this book.

**Dr W G Prasanna Kumar**  
**Chairman, MGNCRE**

Block 1

# Indian Rural Society and Rural Administration

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**Mahatma Gandhi National Council of Rural Education**

Department of Higher Education

Ministry of Human Resource Development, Government of India

Hyderabad - 500004



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# Chapter 1 Rural Society

## Introduction

To understand India's culture it is important to understand the rural society. Modernisation and Westernisation of the Indian society can be linked to its colonial history. When the East India Company arrived to trade in India around 1757 and began to take over administration, India was still ruled by the kings and princes and was in medieval ages. At this point of history, the west had started industrialising and their governments had also started to become democratic. With industrialisation, urbanisation also came about in the west.

After independence from colonial rule in the 1940s, India had 86% rural population and the government took charge of setting up industries because the economy was not modernised and could not have competed with its western markets. In this process, as many critics of the post-colonial industrial policy have pointed out, the growth of the agriculture sector was left behind. Green Revolution came to India in early 1960s and made the country self-sufficient in terms of food production. Later, the White Revolution, also called the Operation Flood was launched in 1970s and improved dairy production. Rural societies in India are now moving towards modernisation with innovation in agricultural practices. But at the same time, these societies uphold the traditional cultural values.

## Objectives

- To understand the complexities of studying the rural societies modernisation
- To map cultural and geographical differences across villages in India
- To study community organisations in India's villages
- Understand local governance in villages

Panchayati Raj	
1.1	Introduction to Rural Society
1.2	Rural Demography
1.3	Rural Social Structure
1.4	Rural Economic Structure
1.5	Rural Power Structure

## 1.1 Introduction to Rural Society

### Studying Rural Societies Indian Context

Rural India is a major focus of many sociological studies. Economist, Sociologists, Political Scientists, Anthropologists and most recently, Development Studies scholars and public policy professionals have centred their interest in understanding villages of India. The academic literature in this field

studies historical influences, regional variations, cultural aspects, governance and political participation, tribal lifestyles, agricultural practices, demographic shifts, to list a few heads.

### India Lives in Villages

Mahatma Gandhi had said these words before India got independence from the British colonial rule that, “the real India lives in its villages”. Seventy years after freedom from the colonial rule, this statement still holds true. Numerically speaking too, a majority of India’s population lives in villages and is engaged in occupations related to farming, agriculture and allied sectors. According to the most recent census of 2011, 68.8 per cent (83.3 crore or 833 million) of India’s population lives in rural areas- this is a considerable majority. The proportion of rural population in 2001 declined from 72.2 per cent to 68.8 in 2011. This statistic also shows that the level of urbanization increased from 27.8 per cent in 2001 census to 31.2 per cent in 2011.

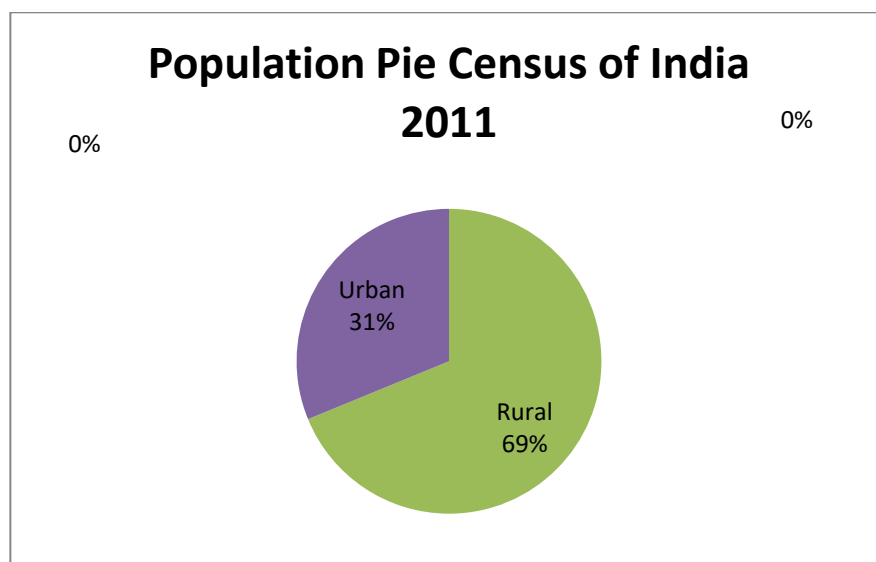


Figure 1.1 Population Pie Census 2011

Further, various estimates from census of India and other surveys held by the Indian government show a trend of rural to urban migration across the country. Mostly, this migration is attributed to search of economic opportunities or higher education.

Rural economy in post-liberalisation India is changing. A study by NITI Aayog has found that, “Contrary to the common perception about predominance of agriculture in rural economy, about two third of rural income is now generated in non-agricultural activities. Similarly, it looks amazing to find that more than half of the value added in manufacturing sector in India is contributed by rural areas. However, the impressive growth of non-agricultural sector in rural India has not brought significant employment gains or reduction in disparity in worker productivity. This underlines the need for a new approach to direct the transition of rural economy.” (Chand, Srivastava and Singh, 2017)

### Traditionalism and Modernity

Rural societies are termed as traditional societies across academic writings. Traditionalism, however, can have specific meanings in different cultures. For most of us who live in India, a village is a symbol of conventional social norms. Community and caste ties also play an important role in the social

make-up of village life. While in terms of geography villages of India can be in deserts in Rajasthan, tribal forests in Odisha or Chhattisgarh, hilly in Jammu and Kashmir, Himanchal, Uttarakhand or the seven sisters of north-eastern India, or they may lie in the interiors of the vast Deccan Plateau; in terms of culture Indian villages have traditional lifestyles.

Scholars such as SH Rudolph and LI Rudolph (1967) have brought out this dichotomy in the village societies of India. From colonial times, roads and railway networks began to connect villages and helped modernity reach into India's rural life. In post-liberalisation India too, the penetration of Fast-Moving Consumer Goods (FMCG) and electronics and mobile penetration has reached villages to introduce modern narratives to the parochial lives. Modernity in Indian villages can also be understood in terms of familiarisation with democratic practices such as voting and use of Electronic Voter Machines (EVMs).

Despite the communication channels that expose India's villages to urban or industrial settings, social structures in village communities remain traditional. These can be understood by modest and indigenous dressing norms, peasant occupations, rigid caste affiliations in kinship ties, tribal sub-cultures and the general day to day community lives of the folks depending on traditions from the region they belong to.

**To Do Activity**

Find out the top ten districts of India with highest rural population from the latest census records.

**Socio-Economic Backwardness in Rural India**

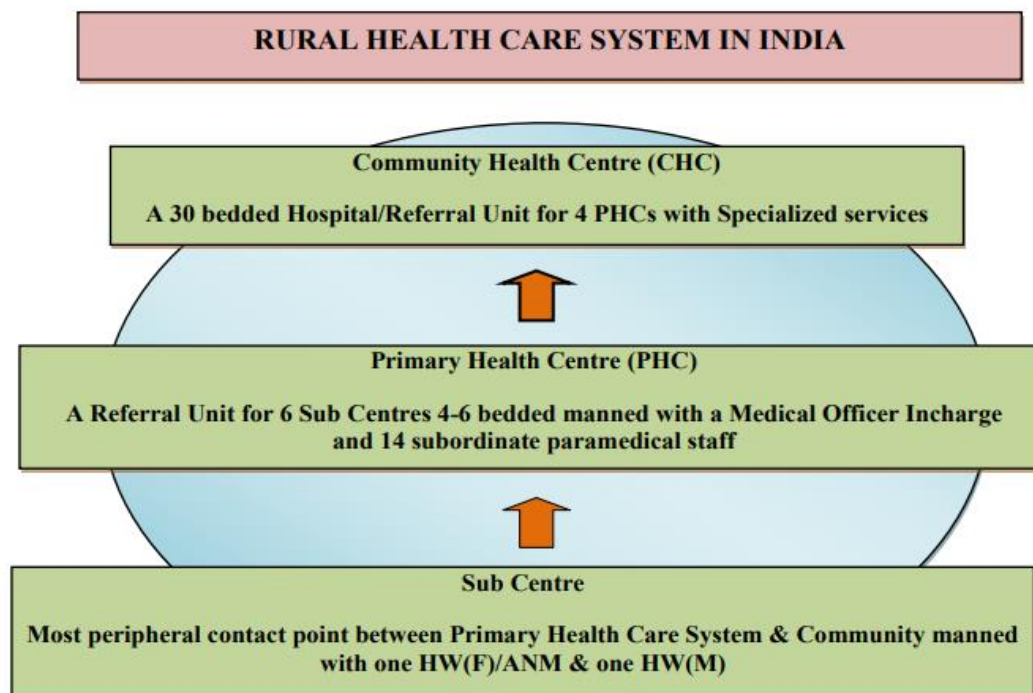
Public infrastructure is the biggest visible difference between a village and a city for any observer. Indian villages, along with representing peasant lifestyles also have different set of physical and social infrastructure from those of cities. Indian cities have roads, highways, flyovers, public transport facilities like local trains, metros, bus networks; villages are often off the highways and do not have public transport systems as reachable or road networks as dense as cities. Rural households in India may not necessarily be connected to metalled or pakka roads. Village case studies from India, for example Palanpur The Economy of an Indian Village by C Bliss and N Stern (1982), will begin with an ethnographic description of the location a reachability of the village.

The Indian government in the past decade has launched nation-wide electrification policies for village households. Access to electricity for Indian villages is a big policy challenge for rapidly developing Indian economy- both generation of electricity for all households and provision of connectivity to each household. Not having access to electricity has major implication for rural societies. It pushes them towards backwardness. Day to day tasks at household-level become difficult to perform and are more time consuming. Also, without electricity, farming activities, most importantly irrigation, have to depend on mechanical or manual labour.

The government keeps a record of healthcare services in the villages. A glance at the government data can help understand the development in the health sector in the villages of India As on 31st March, 2018, there were 158417 Sub Centers (SCs), 25743 Primary Health Centers (PHCs) and 5624 Community Health Centers (CHCs) functioning in the country, according to Ministry of Health and



Family Welfare estimates. Further, data from this 2018 report show that the number of Sub Centers increased from 146026 in 2005 to 158417 in 2018. There has been a significant increase in the number of Sub Centers in the States of Rajasthan (3893), Madhya Pradesh (2318), Gujarat (1878), Chhattisgarh (1382), Karnataka (1300), Jammu & Kashmir (1088), Odisha (761), Tripura (481), Kerala (286) and Uttarakhand (271).



**Figure 1.2 Rural Healthcare System in India**

Source Ministry of Health and Family Welfare, Government of India

Community-level healthcare centres are modelled to provide family health, mother and childcare services and to create family planning awareness in villages. Duflo and Banerjee (2011) in their extensive studies across Indian villages have noted many instances where governance from grassroots level can be improved. For example, the researchers conducted field studies at villages in Udaipur District in Rajasthan and showed the day to day challenges faced by nurses and health workers in performing their duties in the villages.

With a stress on education policies from the government after the incorporation of the Right to Education (RTE) as a fundamental right in 2002, schools in villages are now have become accessible and the government has achieved full enrolment of children at elementary level of schooling. Under the RTE, children up to 14 years of age must receive free and compulsory education and Right of Children to Free and Compulsory Education Act was implemented as a law in 2009 to uphold this provision.

Data records from the Unified District Information System for Education (U-DISE) show rural-urban details of coverage of schools in the chart below.

**Table 1.1 Coverage of U-DISE**

Coverage of U-DISE					
Year	Districts	CD Blocks	Clusters	Villages	Schools
2014-15	680	7257	82077	594473	1516892
2015-16	680	7317	82342	594736	1522346
2016-17	701	7448	82641	594182	1535610

	Year	Total#	Rural	Urban
<b>Total Number of Institutions</b>	2014-15	1516892	1287355	229494
	2015-16	1522346	1289544	232783
	2016-17	1535610	1297083	238520
<b>Recognised Institutions</b>	2014-15	1488218	1264751	223434
	2015-16	1493734	1267386	226329
	2016-17	1503551	1272555	230990
<b>Unrecognised Institutions***</b>	2014-15	28674	22604	6060
	2015-16	28612	22158	6454
	2016-17	32059	24528	7530
<b>Total Teachers</b>	2014-15	8561921	6303292	2258384
	2015-16	8691922	6361626	2330220
	2016-17	8905811	6505128	2400654
<b>Teachers in Recognised Institutions</b>	2014-15	8384113	6173089	2210779
	2015-16	8504235	6228658	2275501
	2016-17	8703641	6361918	2341694
<b>Teachers in Unrecognised Institutions***</b>	2014-15	177808	130203	47605
	2015-16	187687	132968	54719
	2016-17	202170	143210	58960
<b>Total Enrolment**</b>	2014-15	259469730	188359852	71108365
	2015-16	260596960	187868102	72726493
	2016-17	251309665	180248040	71061117
<b>Enrolment in Recognised Institutions</b>	2014-15	255693478	185725728	69966237
	2015-16	256964281	185400546	71561370
	2016-17	247875713	177883263	69991942
<b>Enrolment in Unrecognised Institutions***</b>	2014-15	3776252	2634124	1142128
	2015-16	3632679	2467556	1165123
	2016-17	3433952	2364777	1069175

# Total may not match with the sum of the schools/enrolment/teacher in rural and urban areas because of no response with respect to the location of the school.

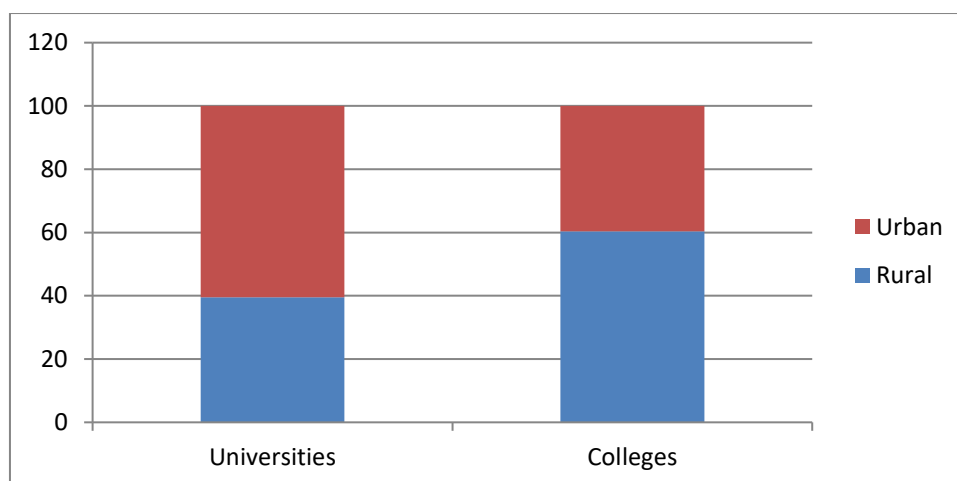
\*\* Actual enrolment reported in U-DISE 2016-17. It excludes the project enrolment of grade XI and XII (Andhra Pradesh -942752 and Karnataka 855988)

\*\*\* Unrecognised institutions includes Unrecognised Madarsa & schools which are not recognised.

Source U-DISE, Flash Statistics on Education 2016-17

([http://udise.in/Downloads/Publications/Documents/Flash\\_Statistics\\_on\\_School\\_Education-2016-17.pdf](http://udise.in/Downloads/Publications/Documents/Flash_Statistics_on_School_Education-2016-17.pdf))

The Government of India also conducts All India Survey of Higher Education (AISHE). Data records from AISHE 2018 report show distribution of universities and colleges in rural and urban India.



**Figure 1.3 Rural-Urban Distribution of Universities and Colleges**

Source AISHE 2018, Ministry of Human Resource Development

Many NGOs work in the field of education at rural level and also help the government in assessing the implementation of policies. One such NGO, with a nation-wide reach is Pratham. This organisation also has members who help the central government in education policy-making. They also conduct surveys across the country to produce their report titled Annual Status of Education Report (ASER). The government has succeeded in sending all children to school, but these civil society organisations help in assessing the quality of public services.

Given that a rural area is defined by a predominance of agricultural activity does not imply that industries do not exist in villages. We shall see in following units how urbanisation trends are taking over and how rural economy is diversifying into other sectors.

## 1.2 Rural Demography

The census surveys are conducted every decade in India and urban and rural areas are defined as follows

An urban unit or a town is defined as “any place with a municipality, corporation, cantonment board or notified town area committee, etc.”. These are also called ‘Statutory Towns’. All other places which satisfy the following criteria are known as ‘Census Towns’ as per the definitions used by the census surveys-

- A minimum population of 5,000
- At least 75 per cent of the male main workers engaged in non-agricultural pursuits
- A density of population of at least 400 per sq. km.

**Table 1.2 Number of Urban Units in India (Source Census 2011)**

Number of Urban Units in India			
	Census 2001	Census 2011	Increase
<b>Total Towns</b>	5,161	7,935	2,774
<b>Statutory Towns</b>	3,799	4,041	242
<b>Census Towns</b>	1,362	3,894	2,532

Rural Areas are all areas which are not categorized as urban area under the definitions above, according to Census definitions.

**Table 1.3 Number of Rural Units (or Villages) in India** (Source Census 2011)

<b>Number of Rural Units (or Villages) in India</b>			
	Census 2001	Census 2011	Increase
<b>Total Villages</b>	6,38,588	6,40,867	2,279

As noted above too, according to the 2011 Census data, 68.8 per cent of India's population is rural. Further, 72.4 per cent of workforce in India also lives in villages. Though, the 2011 census has shown a decline of 5.9 per cent points in rural population growth and an increase of 0.3 per cent points in urban population growth from the 2001 census.

**Table 1.4 Growth Rate of Population (in per cent)** (Source Census 2011)

<b>Growth Rate of Population (in per cent)</b>			
	1991-2001	2001-2011	Difference
<b>India</b>	21.5	17.6	-3.9
<b>Rural</b>	18.1	12.2	-5.9
<b>Urban</b>	31.5	31.8	+0.3

This data implies a trend of urbanization in India. Urbanization trend, to put in simple words, can take place in two ways- one, when rural population migrate to cities and two, when villages transform to urban areas and are reclassified. Studies estimate that more than half of the increase in population in urban India during this period can be attributed to the migration from rural to urban areas and re-classification of rural settlements into urban rather than natural increase (Pradhan 2013). However, demographic projections by the United Nations (2012) estimates do show that India will continue to be predominantly rural till the year 2050. Urban population is estimated to overtake the rural population after this marking year.

**To Do Activity**

What other countries of the world have similar rural-urban demographic profiles as compared to India? Where do countries with such profiles stand in terms of economic growth?

There has been regional or state-wise variation in rural population from 2001 census to 2011 in India. During the 2001-11 decade the growth of population living in villages as estimated at 12.2 per cent. Growth of rural population has been estimated to be steadily declining in India since 1991. States of Meghalaya at 27 per cent and Bihar at 24 per cent witnessed largest growth of rural population among Indian States in 2001-11. On the other hand, four States recorded a decline in rural population in the decade of 2001-11. These are Kerala by 26 per cent, Goa by 19 per cent, Nagaland by 15 per cent and Sikkim by 5 per cent.

## Rural Poverty

Compared to urban India, there is more poverty in rural India. Estimation of poverty from government of India shows a decline in both poverty ratio and the number of people living under the poverty level in rural India between 1993 and 2011. But urban India had more decline in people living below poverty line.

**Table 1.5 Percentage and Number of Poor Estimated from Expert Group (Tendulkar) Methodology**

Percentage and Number of Poor Estimated from Expert Group (Tendulkar) Methodology						
Year	Poverty Ratio (per cent)			Number of Poor (million)		
	Rural	Urban	Total	Rural	Urban	Total
1993-94	50.1	31.8	45.3	328.6	74.5	403.7
2004-05	41.8	25.7	37.2	326.3	80.8	407.1
2009-10	33.8	20.9	29.8	278.2	76.5	354.7
2011-12	25.7	13.7	21.9	216.7	53.1	269.8

Source Planning Commission Archive, 2014, Government of India

In order to further understand poverty in rural India, it is important to highlight more data points about rural population. Compared to urban India, rural literacy rate is lower by 16 percentage points. There is a big gap between male and female literacy in villages. According to 2011 census of India data, only 58 per cent women in Indian villages are literate. The comparisons are illustrated in data table below.

## Literacy Rates

**Table 1.6 Literacy Rates (in per cent)**

Literacy Rates (in per cent)								
Persons			Male			Female		
Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
73	68	84	81	77	89	65	58	79

(Source Census 2011; Figures are rounded off)

Villages of India are also socially more backward than cities. The proportion of the Scheduled Caste (SC) population in villages is 19 per cent, compared to 13 per cent in cities. Also, mostly tribal populations live in villages. The proportion of STs in villages is 11 per cent compared to 3 per cent in cities. The Indian social structure has been historically affected by the presence of the caste system. In most cases, people belonging to lower castes have faced social exclusion and untouchability in extreme cases. The government policy has taken many steps to improve the status of those considered backward because of their caste.

**Table 1.7 Proportion of Scheduled Castes and Scheduled Tribes Population (in per cent)**

(Source Census 2011; Figures are rounded off)

Scheduled Castes			Scheduled Tribes		
Total Persons			Total Persons		
Total	Rural	Urban	Total	Rural	Urban
17	19	13	9	11	3

**To Do Activity**

Find out the top five and bottom five states of India with highest population of SCs and STs. How do you think this affects the social structures in villages of these states?

Another important aspect of rural demography is the working population. In the census surveys, main workers are defined as those who work for more than six months in a year. Marginal workers are those people with less than six months or less than three months of work in a year. In the data table below, marginal workers category is combined to show both workers with less than six months and less than three months of work. In comparison to cities, lesser proportion of people is engaged in main work in the villages. Also, the proportion of people with marginal work is higher in the villages. This indicates that there are more work opportunities in cities. Also, comparably, more people live in villages in India, so, the number of people in villages with no jobs is higher than cities according to the demographic data shown in the census 2011.

**Table 1.8 Proportion of Worker Population to Total Population in Cities and Villages**

	Main Workers (in per cent)			Marginal Workers (in per cent)		
	Persons	Males	Females	Persons	Males	Females
Total	29.9	43.8	15.2	6.1	3.7	13.6
Rural	29.5	41.6	16.7	8.1	4.9	16.4
Urban	31.0	48.7	11.9	2.1	1.5	4.6

(Source Calculated from census of India 2011)

**1.3 Rural Social Structures****Village Community Life**

Caste-system and religious affiliation plays an important role in village community lives. A variation in castes across regions of India can be studied in detail using the Government of India's state-wise lists of categories of castes in India. This trend shows regional diversity in the existence of various castes. The following figure shows the social structure of the caste system in India.





**Figure 1.4 Social Structure of Castes in India**

As noted in 1.2, villages have a bigger proportion of populations from the Scheduled Castes and Scheduled Tribes. Caste plays an important role in the structuring of the traditional societies in India's villages and any discussion about rural social structures cannot be complete without an understanding of the role caste may play in the communities. In mostly all parts of India, castes and sub-castes are referred to as jati. This is an Indo-Aryan word which means a category or social class of people related through either same physical characteristics or social-moral values. Further, the word can also be used in the sense of genetic affiliation, species, or race. Caste is a systematic basis upon which the jatis are organized in the society. In India, there is not a set pattern though, in different regions of the country caste hierarchy may be different based on cultural or historical factors. They may be different in different villages too.

Indian anthropologists have written about the caste system from many perspectives. For example, Dipankar Gupta in his book *Interrogating Caste* (2000) has written about uniformity in caste hierarchies across India. MN Srinivas is the most celebrated Indian anthropologist who wrote about caste and social stratification in India. Social stratification is a way of social organization based on discriminating social groups and dividing people into hierarchical groups based upon their occupation, income, wealth and social status. This stratification may also emerge from power, social or political, derived by a particular group of people. Simply put, stratification is a relative social status of people within a social group, village, or community. Srinivas conducted his study in the village of Rampur in Mysore district in Karnataka from the 1950s to the 1970s.

Another important contribution towards understanding caste-related violence in India is Smita Narula's book *Broken People: Caste Violence against India's "Untouchables"*. Published in 1999, this book focuses on Dalits in India.

Even during the British period, religious riots were an administrative challenge- both in villages and

cities. In 21<sup>st</sup> century India as well, religious tensions are a part of community life but the causes and intensity of such tensions vary from region to region. India is a land of diversity of communities and there are also villages where different communities live in harmony. Many instances of coexistence of religious communities are reported from time to time in the media reports. Across villages in India, there are mosques, temples, churches and gurudwaras that do community work for each other.

**To Do Activity**

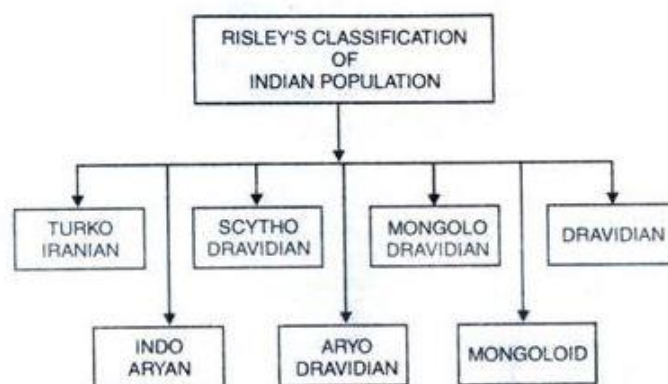
Find instances of communal harmony using media reports. How do you think communal peace can contribute to well-being in a community in Indian contexts?

**Tribes of India**

Proportionally, 11% of rural population in villages of India is tribal population. Anthropologists studying tribes of India have classified them into various heads. First category is geographical classification. Indian subcontinent can be divided into Northern and North-Eastern Zone, the Central or Middle Zone and the Southern Zone and tribes can be associated with the specific regions. Example of such a classification can be found in D.N. Majumdar and T.N. Madan’s Introduction to Social Anthropology published in 1957.

Language is the next category for classifying Indian tribes. There are chiefly four language groups that can be associated with the tribes of India. These are Indo-Aryan, Tibeto-Burman, Austro-Asiatic and Dravidian. Writers such as L.P Vidyarthi and Binary Kumar Rai (1977) have put forward linguistic classifications in their book titled The Tribal Culture of India.

Another form of classification of Indian tribes can be on the basis of race. Sir Herbert Risley, a nineteenth century English ethnographer, made the first scientific attempt to ethnically classify Indians according to their racial characteristics. He identified seven racial types in India namely, Turko Iranian, Indo-Aryan, Scytho-Dravidian, Aryo-Dravidian, Mongolo-Dravidian, Mongoloid and the Dravidian.



**Figure 1.5 Classification of Indian Racial Types**

Indian tribes can also be studied on the basis of the mode of livelihood or the subsistence pattern. Tribal activities can be described as follows- hunters and food gatherers, pastoralists, horticulturists, hill cultivation, simple artisan, folk artist, labourers engaged on farms or in factories where such occupations are available.

**To Do Activity**

Create a map of important tribes of India. List their main occupations.

**Position of Women and Patriarchal Social Values**

An important aspect about rural society and its structure is the position of women in the villages. Census 2011 has shown that sex ratio has improved since 2001 from 933 women per 1000 men to 940 women per 1000 men across India. But rural India saw an increase of only one per cent point from 946 in 2001 to 947 in 2011. In urban areas the increase was considerably higher at 26 points from 900 in 2001 to 926 in 2011.

The family structures in villages are conservative and patriarchal. We can also observe from data on rural literacy also discussed in 1.2 that female literacy is also low in rural areas at merely 58% in 2011 census. Though, rural women form a bigger part of the workforce than their urban counterparts, they are actually engaged in informal sectors. The practice of child marriages in traditional cultures also affects women and their socio-economic development. Early marriage is also one of the causes of poor maternal health. The government has taken many steps to stop child marriages. The legal age for marriage in India is 18 years for girls and 21 years for boys, in India as per the 1978 amendment in the marital laws. Along with this, the government runs many awareness programmes and promotes delay of marriages and focus on girls' and women's health through village health workers as well.

**Out-Migration from Villages**

Because of lesser opportunities, the rate of out-migration from villages of rural to urban migration is high in India. "Although rural to urban migration has been the dominant component of urbanization in the western countries, India has experienced rapid urban population growth as a result of higher contribution of urban natural increase. In the decade preceding the Census 2011, net rural to urban classification in India contributed about one-third to urban population growth compared one-fourth by net rural to urban migration" (Bhagat, 2012). In another paper Prof Bhagat (2017) has shown how migration helps foster development as migrants from villages to urban areas learn more skills and are pulled out of poverty. Policies in India are often aimed at reducing rural to urban migration and tend to not include migration as an important factor in economic development.

Traditionalism in village culture has affected stratification of the society. Such stratification causes socio-economic backwardness. Due to a strict caste system which is also based on functional roles of the communities, people are not able to pull themselves out of the family trades. This is especially true for the lower and backward castes.

Also, traditional occupations in modernising economies may not necessarily turn out to be very profitable. For example, handloom industries in many villages of India are suffering in modern times due to lack of economically beneficial policies for the artisans.

## 1.4 Rural Economic Structure

Rural economy is defined by agricultural activity. If a majority of the population in a particular area is engaged in farming and allied sectors and are governed by rural local governments, it is categorised as rural. Since agriculture is considered to be the main occupation of the village folks, this unit will focus on agrarian economy and its institutions in India.

Latest government assessment of changing rural economy has been highlighted in a paper by top policy practitioners from the NITI Aayog in a discussion paper titled “Changing Structure of Rural Economy of India Implications for Employment and Growth”. The data table below has been taken from this paper to show how the share of the rural economy has been declining in India’s Net Domestic Product (NDP) and also the people’s participation in rural workforce is decreasing.

Year	Economy	Workforce
1970-71	62.4	84.1
1980-81	58.9	80.8
1993-94	54.3	77.8
1999-00	48.1	76.1
2004-05	48.1	74.6
2011-12	46.9	70.9

(Note The data on rural and urban net domestic product (NDP) is available for the years 1970-71, 1980-81, 1993-94, 1999-00, 2004-05 and 2011-12 at current prices from Central Statistical Office. The information on different aspects of employment in the country was extracted from the unit-level data of quinquennial employment and unemployment surveys conducted by National Sample Survey Office (NSS-EUS). The first quinquennial NSS-EUS was carried out during 1972-73 to assess the volume and structure of employment and unemployment in the country. Thereafter these surveys were repeated in the years 1983, 1993-94, 1999-00, 2004-05, 2009-10, and 2011-12.)

Table 1.9 Share of rural areas in total Net Domestic Product and Workforce (in per cent)

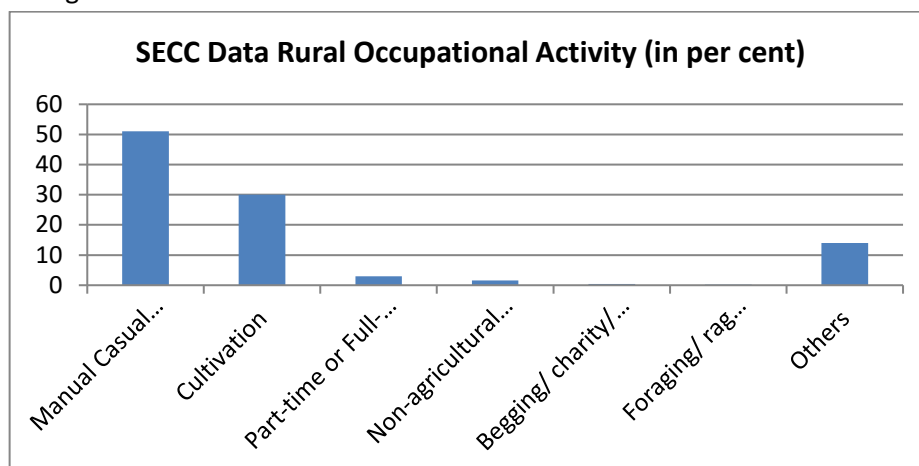
This paper notes an interesting aspect about the rural economy. The rural economy is no longer only limited to agricultural activities, as is perceived. To quote from the paper “The most striking change in rural share was observed in the case of manufacturing sector. Between 1970-71 and 2011-12, the share of rural areas in output of manufacturing sector doubled and exceeded the manufacturing production in urban areas. Rural areas contributed 51.3 per cent of manufactured output in year 2011-12. However, this sharp increase in the rural share in output did not fetch any increase in rural share in employment in manufacturing sector. On the contrary, rural share in total manufacturing employment in the country declined by 4.1 percentage points during the forty years ending with 2011-12” (Chand, Srivastava and Singh, 2017).

### To Do Activity

Plan a case study at a village in your state and chalk out the structure of the economy.

Growth on non-farm sectors in villages is an interesting trend, but the government of India’s Socio-Economic Caste Census (SECC) survey released in 2015 showed some statistics about rural economy. The data from the report showed that 75% of household in villages of India earn a monthly income

of less than Rs 5,000. And it further showed that manual labor was the main source of income for 51% of households in rural areas. The table below shows occupational activities of people in India's villages according to SECC 2015 data.



**Figure 1.6 Rural Occupations (SECC Data)**

### **Informal Economy and Money-Lending NABARD, Agricultural Credit and Loan Wavers**

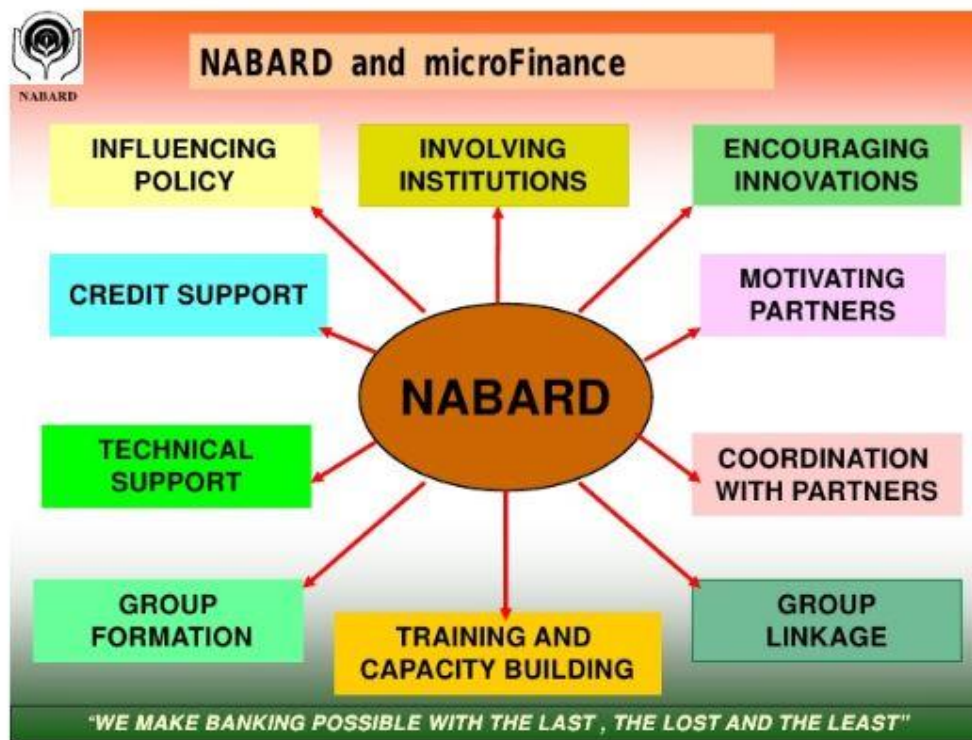
One of the key features of the rural debt economy has been the informal or non-institutional money lending practices. The All-India Debt and Investment Survey 2012, was released by the Ministry of Statistics and Programme Implementation (MoSPI) in 2013. It was found that almost 48 per cent farmers across villages of India had taken loans from informal institutions such as local agricultural moneylenders or land-owning elites. Providing institutional credit to farmers has been an important policy challenge for India.

Credit is important for the development of the villages. This has been a cause of concern for the policy-makers in India from the early stages when planned economic development was started in 1950s. In the late 1970s, The Reserve Bank of India (RBI) on the insistence of the Government of India, formed a Committee to Review the Arrangements for Institutional Credit for Agriculture and Rural Development (CRAFICARD) to look into the aspect of rural credit. The Committee was formed under the Chairmanship of Shri B. Sivaraman, who was also a former member of the Planning Commission of India.

The interim report of this Committee was submitted in November 1979. This report suggested the need for a new organisational device for providing specialized attention, and direction to rural credit related issues to aid in economic development of villages. This is what led to the formation of the National Bank for Agriculture and Rural Development (NABARD). It was approved by the Parliament through an act in 1981.

NABARD formally came into existence on 12 July 1982 and the agricultural credit functions that the RBI handled up to now were transferred to this organisation. The Agricultural Refinance and Development Corporation (ARDC) and Agricultural Credit Department (ACD) and Rural Planning and Credit Cell (RPCC) under the RBI were replaced by NABARD upon its formation. In the early 1980s, NABARD was set up with an initial capital of Rs.100 crore (Rs 1000 million). As on 31 March 2018 it paid up capital is at Rs.10,580crore (Rs 105,800 million).

Rural India’s financial empowerment is the main goal of NABARD. Since its formation, the body has endeavoured to build a financially inclusive rural Indian economy. NABARD has specific goal-oriented departments to meet its policy requirements- these can be categorized broadly into three heads “Financial, Developmental and Supervision” according to NABARD’s policy documents. Through these departments the body tries to reach out to almost every aspect of India’s rural economy. It provides expertise and credit support for providing refinance support to build infrastructure in villages; for preparing credit plans at district level to guide and motivate the banking industry at local levels in achieving their development targets. NABARD also supervises Cooperative Banks and Regional Rural Banks (RRBs) in them developing sound banking strategies and practices for the specific rural needs. It also helps in designing new development schemes for rural India and consults for the implementation of the Government of India’s development schemes. Training of handicraft artisans and providing them a marketing platform for selling their produce is also one of the functions of NABARD.



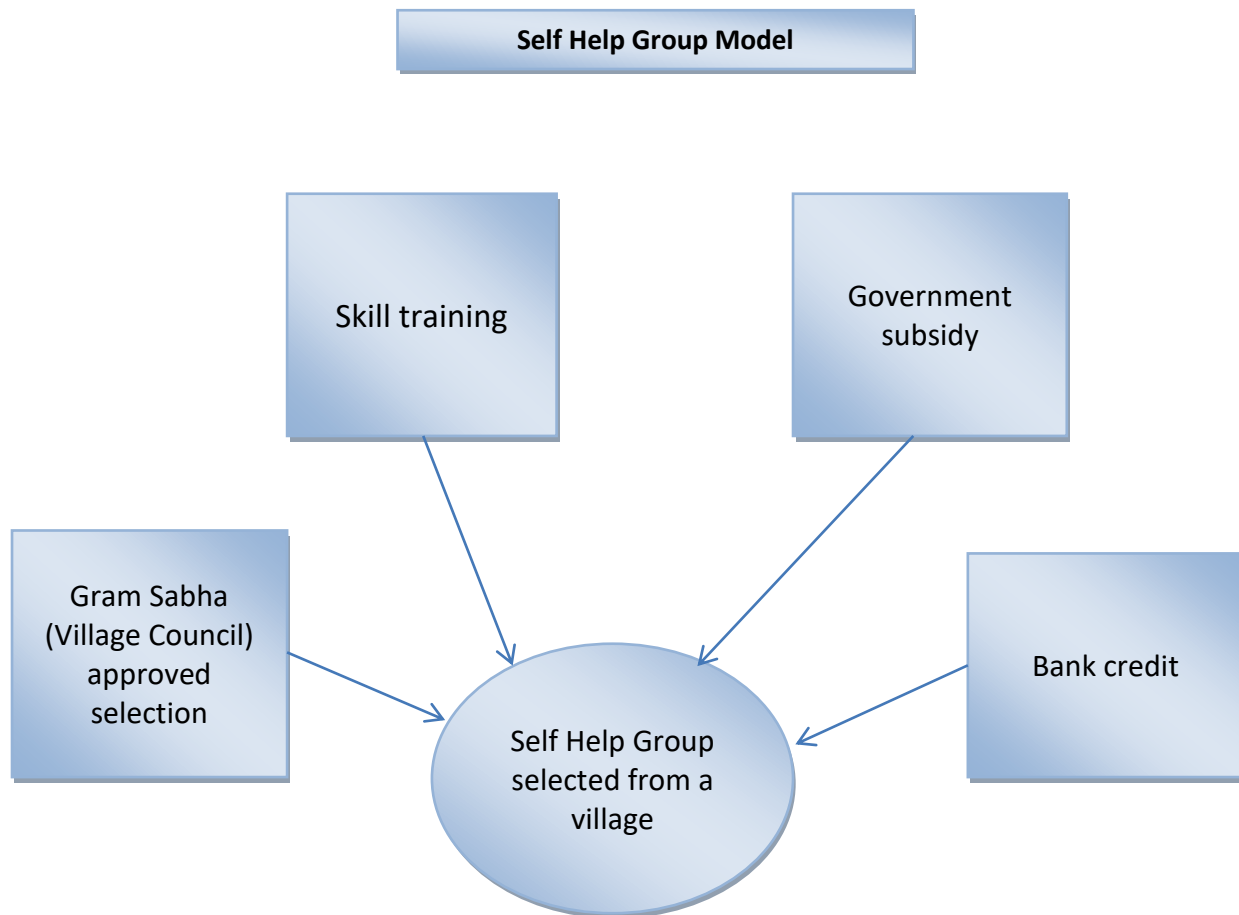
**Figure 1.7 NABARD and Micro-finance**  
Image Source NABARD

Over the years NABARD has achieved many goals in rural credit and micro-financing services. This has helped improve many of rural lives across the India. Most important achievement has been the Self-Help Group- Bank Linkage Project launched by in 1992, which grew into the world’s largest micro finance project. NABARD also takes pride in Kisan Credit Card, designed by the body which is one of the major sources of relief for the farmers. The bank has about financed one fifth of India’s total rural infrastructure, according to its estimates in 2018. They are also pioneering in the field of watershed development as a tool for sustainable climate proofing.



### Models of Rural Economic Development Self-help Groups and Rural Cooperatives

The Self-Help Group (SHG) model of development for rural India has been popularised by NABARD, as we note above. SHGs function at community level to foster rural development through skill training, government's assistance, micro-finance and cooperation of the community members who are a part of the SHG. Below is a model of how an SHG is organised.

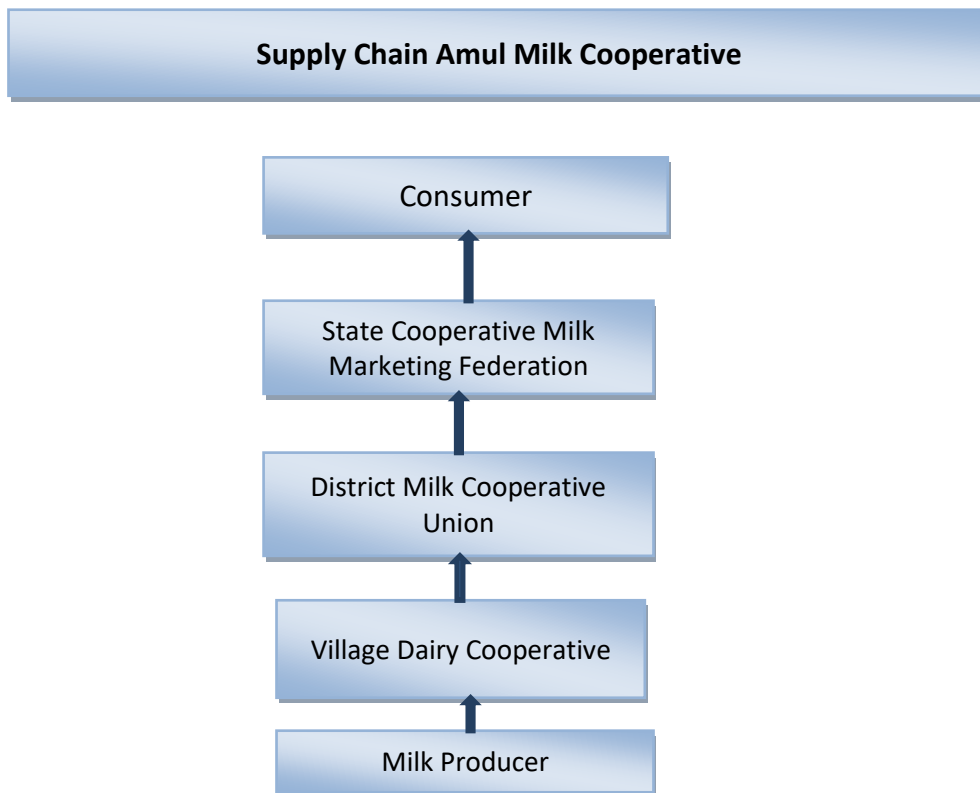


**Figure 1.8 Self-help Group Model**

Members of an SHG help and support each other. They are also collectively responsible towards loan repayments even of individual members. The local government committees at village level also help in formation of SHGs and monitor progress and resolve disputes. Skill training is carried out for members to set up local small-scale industries or handicrafts units. At times, the government subsidises training or credit for SHGs under various schemes. NABARD also provides knowhow other than micro-credit for the SHGs.

In the 1970s, India witnessed a revolution in the dairy sector. This was referred to as the White Revolution or Operation Flood, as is also mentioned in the introduction to this Chapter.

This revolution provided one of the most successful models of a rural cooperative from India. A discussion on models of rural development is incomplete without the mention of the Amul model as shown in the diagram below.



**Figure 1.9 Rural Cooperatives Model**

This model is also based on community mobilisation at village levels. This was started in Anand in Kaira district of Gujarat. This model is heavily based on strong institutional involvement of all stakeholders who form the cooperative. A big hazard for farmers is to supply their produce to the consumers. This model takes care of the supply networks and at the same time involves farmers as professional partners. The cooperatives also provide advisory and veterinary services to the milk farmers. This ensures efficiency in their operations.

The rural economic structure is a network of mixed stories of success and failure for the people. Farming as an occupation, though declining, is still the biggest sector that employs people in the villages. The government of India also runs the world’s largest rural guarantee scheme- the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) in villages. This scheme guarantees 100 days of work- mostly physical labouring jobs that don’t require any skill- to all seekers in their own village and has fixed a minimum equal wage for all workers. This scheme has also helped reduce extreme poverty for many families.

**To Do Activity**  
 Plan a visit to a village industrial unit and observe its economic model from the grassroots.

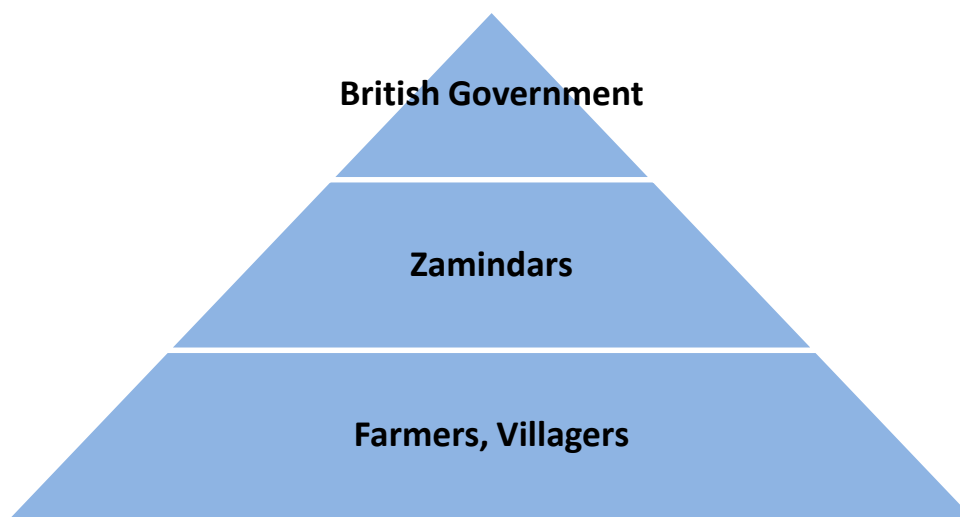
### 1.5 Rural Power Structure

An understanding of the power structure in villages is important for both political-sociological reasons as well as for policy practitioners. India's demographic structure and economic profile has been rural for centuries. During the Mughal period and then the British colonial rule, networks of rural local aristocracy and patronage were created. This was mostly done to ease the revenue collection for the governments that were on the top of the administrative system.

#### Zamindari System Historical Influences on Rural Power Networks

Zamindari and Ryotwari were created by the British administration as a system of land tenure in pre-independence times. These classes were generally powerful upper caste people who were responsible for collecting land revenue and taxes from the farmers and village folks.

The pyramid diagram below shows the flow of power in the system.



**Figure 1.10 Zamindari System**

The Zamindars received commissions from the government for their services. Zamindari was also hereditary and the family controlled power positions over the farmers. In 1793, Lord Cornwallis had established the Permanent Settlement Act under which Zamindars were made land owners. It was introduced in four provinces under the British rule- Bengal, Bihar, Orissa and Varanasi.

Similarly, in 1820, Ryotwari system was started in the provinces of Madras, Bombay, parts of Assam and Coorgh under British India. Under this system, farmers were land owners or Ryots. They paid the revenues directly to the British government.

Another system of land revenue under the British government was created in 1833. This was the Mahalwari system. It was introduced in the Central Province, North-West Frontier Province, Agra, Punjab and the Gangetic Valley provinces under the British rule. This system comprised features of both the Zamindari system and the Ryotwari system. The Mahals were administrative divisions of land and could be comprised of one or two villages. The farmers were land-owners. A committee system was established to collect taxes from the Mahals.

After independence from the British rule, the constitution of India was enforced in 1950. The constitution enshrined right to property as a fundamental right. The newly formed states took the

initiative to abolish Zamindari systems under their jurisdiction. But the provisions of this fundamental right were in conflict with these systems. The constitution of India had to be amended under the first amendment act, 1951 and the second amendment act 1955 to finally abolish Zamindari and the dated British land tenure systems.

The fundamental rights had also abolished titles under the British government. However, the legal power of this elite class has been abolished by the constitution of India, but in some parts they still influence aristocratic control over local politics. Also, land-ownership was not totally lost for this class. Owning land in villages implies power and control over resources.

### Land-owning Farmers and Agricultural Labourers

Let us now try and look at the data of agriculture labourers, according to Census 2011. Very often, agricultural labourers are added with cultivators to calculate the number of farmers. This is not the case with the Census, which defines agriculture labour 'A person who works on another person's land for wages in money or kind or share is regarded as an agricultural laborer. She or he has no risk in the cultivation, but merely works on another person's land for wages. An agricultural labourer has no right of lease or contract on land on which she/he works.' (Salve, 201)

**Table 1.10 Agricultural Labourers and Cultivators**

Year	Agricultural labourers (in million)	Percentage of Agricultural labourers	Year	Cultivators (in million)	Percentage of cultivators
1951	27.3	19.5	1951	69.9	49.9
1961	31.5	16.7	1961	99.6	52.8
1981	55.5	22.7	1981	92.5	37.8
1991	74.6	23.8	1991	110.7	35.2
2001	107.5	26.7	2001	127.6	31.7
2011	144.3	30	2011	118.6	24.6

(Source Census of India)

The number of people engaged as agricultural labourers in villages of India has been on an increase since 1951 as shown in the data table above from the Census surveys. The proportion of agricultural labourers has also increased from 19% in 1951 to 30% in 2011.

This means that the proportion of land-owning farmers has decreased over the past decades. Between 2001 and 2011, the number of land owning farmers has also reduced from 127.6 million to 118.6 million- a fall of 9 million. Whereas, the number of people engaged as farm labourers has increased by 38 million. Reduction on land-owning farmers and increase of agricultural labourers' hints at a changing power structure in the rural economy.

### Local Leadership and Influence of Social Stratification on Distribution of Resources

Local patronage networks in villages influence implementation of government policies and distribution of resources for infrastructure development at village level. Some studies done by political-economists may be noteworthy here.

Francine Frankelin in her book *India's Political Economy 1974-2004*, published in 2005, has observed historically that around the time the Third Plan (1961- 66) from the Planning Commission of India was implemented, the politics of accommodation at local levels had taken over at the cost of socio-economic goals. Local elites in the villages such as the land-owning elites, had taken over the control of local politics and the expectation that the village cooperatives will ensure participation of the poor people could not be realised. The resources that were provided to the villages under the Community Development Programme were also taken over by the local elites, she notes in her studies.

In another instance, Rob Jenkins (1999) in his book *Democratic Politics and Economic Reform in India* has tracked the employment guarantee schemes that were implemented in villages. He says that mass politics always need a socialist mask and schemes that offer job guarantee for poor focus on building assets such as road, canals are used by middle-class and land-owning farmers in villages rather than the poorer or backward communities. Also, local elites, bureaucrats and politicians have a bigger say in selection and the power in the sanctioning of such projects. The infrastructure needs of the poor people get side-lined. The beneficiaries of the job guarantee are only the poorest in the villages as these jobs demand a lot of physical labour and pay minimum wages. But the benefits of the development do not go to them. Further, he also comments on corruption in the job guarantee schemes but still, he says that it may not be the most economically efficient distribution but it succeeds in engaging the poor and satisfying the local needs.

### **Summary**

This Chapter has focused on introducing rural socio-economic structures to the readers. It touches upon the main aspects of rural lives and highlights macro statistics from government records. Some notable academic works have also been cited in the text that the readers can study in detail. The Chapter focuses on sociological aspects of rural lives in depths. It uses historical references to establish problems and at the same time highlights successful policy initiatives in the field of rural development.

### **Model Questions**

1. What are the rural to urban migration trends in India from government statistics and highlight the reasons for such migration?
2. How can better education and healthcare facilities benefit the rural societies?
3. What are the main indicators for socio-economic backwardness of rural populations of India?
4. Do you think local power politics can affect development of villages? Give arguments for or against the issue.
5. How would you classify rural India in terms of geography?
6. Give suggestions for creating more work opportunities in rural economies across India.

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# Chapter 2 Panchayati Raj

## Introduction

Rural self-governments or what are known as panchayats in India were set-up in villages of India after Independence. Mahatma Gandhi was an exponent of decentralization of political and financial powers that are vested in governments. He advocated the idea of assigning the highest powers to the administration at local levels.

Local self-governments are important because they are the closest to the people. Governments at village or city level also serve as training grounds for future politicians of the country. Also, local self-governments are participatory form of democracy. Due to geographical and cultural factors, every region faces challenges and development needs that may be specific to them. Local governments serve to sort the regional issues of development at the regional level.

In this Chapter, we will study the historical evolution of the Panchayats in India, the importance of panchayats in villages, the structures and composition of panchayats with a focus on constitutional provisions.

## Objectives

- To highlight the historical development of the panchayat institutions in India through governance reports and reforms since independence
- To reflect on the panchayat structures and bodies through the constitutional provisions
- To understand the importance of panchayats for rural development and democracy

## Structure

Panchayati Raj	
2.1	Evolution of Panchayati Raj in India
2.2	Role of Panchayati Raj
2.3	Structures and Tiers of Panchayati Raj
2.4	Rural Administration
2.5	Relationship with Bureaucracy

## **2.1 Evolution of Panchayati Raj in India**

### **Gandhian Ideas on Panchayats before India's Independence**

Gandhi referred to Panchayati Raj as village Swaraj. He wanted each village to be like a small republic, self-sufficient in its vital wants. He advocated that local bodies must enjoy the maximum freedom of deciding the affairs of the locality.

In Young India (28.05.1931), Gandhi had described the panchayat system of local self-governments as, "Panchayat has an ancient flavor; it is a good word. It literally means an assembly of five elected by villagers. It represents the system, by which the innumerable village republics of India were governed."

After independence from British rule in 1947 and the enforcement of the constitution of India in 1950, the Panchayat Raj system of local government was first established by the state of Rajasthan in Naguar district on 2 Oct 1959. Later in the following decade, other state governments also adopted this system of local self-government in the villages. Laws were passed by each of the states to establish panchayats within their jurisdiction.

Panchayati Raj system in India in its present form is a product of many governance recommendations. These can be best understood through the reports of the following committees-

#### **Balwant Rai Mehta Committee**

The Balwant Rai Mehta Committee, headed by MP Balwantrai Mehta, was a committee appointed by the Government of India in January 1957 to examine the work of the Community Development Programme (1952) and the National Extension Service (1953), to suggest measures to improve their work. The committee's recommendation of the committee by NDC in January 1958, and this set the stage for the launching of Panchayati Raj Institutions throughout the country. The committee recommended the establishment of the scheme of 'democratic decentralization', which finally came to be known as Panchayati Raj. Democratic decentralisation means allocating more powers to the governments that are closer to the people than the central government; in this case the local self-governments at villages.

#### **Main Recommendations on Panchayati Raj Institutions (1957)**

1. The Government should divest itself completely of certain duties and responsibilities and devolve them to body which will have the entire charge of all development work within its jurisdiction, reserving to itself only the functions of guidance, supervision and higher planning.
2. At the Chapter level, an elected self-governing institution should be set up with its jurisdiction co-extensive with a development Chapter.
3. The panchayat samiti should be constituted by indirect elections from the village panchayats.
4. The functions of the panchayatsamiti should cover the development of agriculture in all its aspects, improvement of cattle, promotion of local industries, public health, welfare work, administration of primary schools and collection and maintenance of statistics. It should also act as an agent of the State Government in executing special schemes of development entrusted to it. Other functions should be transferred to the panchayatsamitis only when they have started functioning as efficient democratic institutions. '

5. The State Government should give to these samitis adequate grants-in-aid conditionally or unconditionally or on a matching basis, with due regard to economically backward areas.
6. All Central and State funds spent in a Chapter area should invariably be assigned to the panchayatsamiti to be spent by it directly or indirectly excepting when the samiti recommends direct assistance to an institution.
7. A certain amount of control should inevitably be retained by the Government, e.g., the power of superseding a panchayatsamiti in public interest.
8. The constitution of the panchayat should be purely on an elective basis with the provision for the co-option of two women members and one member each from the Scheduled Castes and Scheduled Tribes. No other special groups need be given special representation.
9. Main resources of income of the panchayat will be property or house tax, tax on markets and vehicles, octroi or terminal tax, conservancy tax, water and lighting rate, income from cattle ponds, grants from the panchayatsamitis and fees charged from the registration of animals sold.
10. The budget of the village panchayat will be subject to scrutiny and approval of the panchayatsamiti, chief officer of which will exercise the same power in regard to the village panchayat as the collective will in regard to the panchayatsamiti. No village panchayat should however, be superseded except by the State Government who will do so only on the recommendation of the ZilaPrishad,
11. The compulsory duties of the village panchayats should include among others provision of water supply, sanitation, lighting, maintenance of roads, land management, collection and maintenance of records and other statistics and the welfare of backward classes. It will also act as an agent of the panchayatsamiti in executing any scheme entrusted to it.
12. The judicial panchayat may have much larger jurisdiction than even a Gram Sevak's circle, and out of the panel suggested by village panchayats the sub-divisional or district magistrate may select persons to form judicial panchayats.
13. To ensure necessary coordination between the panchayatsamitis, a ZilaParishad should be constituted consisting of the presidents of these samitis, M.L.As and M.Ps representing the area and the district level officers. The collector will be its chairman and one of the officers will act as Secretary.

### **Ashok Mehta Committee**

In late 1970s, the government of India appointed a high-powered committee, chaired by Sri Asoka Mehta on the working of panchayati raj throughout India. The report of this committee was important and eagerly awaited by everybody interested in panchayati raj movement, especially in the context of the prevailing national consensus on decentralization at that time.

### **Main Recommendations of the Ashok Mehta Committee on Panchayati Raj Institutions (1978)**

1. In the Panchayati Raj structure, there should be a two-tier set up, a district level, zilaparishad and a Mandalpanchayat covering a population of 15,000 to 20,000.
2. With the two-tier structure, the Committee also suggested ultimate abolition of the Chapter as a unit of developmental administration. 3. All the development functions relating to a district which are now performed by the State Governments should be placed under the zilaparishad.
3. The term of Panchayati Raj institutions should be 4 years. Direct elections to these bodies

should be held simultaneously.

4. Political parties could participate in the Panchayati Raj elections.
5. Elections to Panchayati Raj bodies should be conducted by the Chief Electoral Officers of the States in consultation with the Election Commission.
6. Nyayapanchayats should be kept separate from the developmental panchayats. A qualified judge should preside over them and elected panches should act as members of benches of Nyayapanchayats.
7. Panchayati Raj bodies should normally not be superseded, but if supersession become necessary, election should be held within six months.
8. Representation of the scheduled castes and scheduled tribes in all Panchayati Raj bodies should be on the basis of their population.
9. There should be complete transfer of the land revenue collections to panchayati Raj institutions over a period of five year.
10. A permanent annual grant of not less than Rs.2.50 per capita should be made to the mandalpanchayats.
11. The committee agreed to the need for some provision in the Constitution in order to provide the Panchayati Raj institutions the requisite status as well as assurance of continuous functioning, and wanted that this aspect should be considered.

#### **G.V.K. Rao Committee**

The main purpose of this committee was to examine rural development and implementation of poverty alleviation programmes. This committee was set-up by the Ministry of Agriculture. This committee also highlighted the need for the coordination of rural banks and administration to foster rural development.

#### **Main Recommendations of G.V.K. Rao Committee on Panchayati Raj Institutions (1985)**

1. Panchayati Raj Institutions have to be activated and given all the support needed so that they can become effective organizations for handling people's problems. Elections to these bodies should be held regularly.
2. The Committee recommended a 3-tier structure for Panchayati Raj Institutions.
3. The district should be the basic unit for policy planning and programme implementation. The ZilaParishad should, therefore, become the principal body for management of all development programmes which can be handled at that level.
4. The President of the ZilaParishad can be directly elected for a term co-terminus with the Zilaparishad or for one year each on the Mayoral Pattern. The work of the ZilaParishad should be done by a number of Sub-Committees elected on the basis of the proportional representation so that participatory democracy could be developed and encouraged.
5. Panchayati Raj Institutions at the district level and below should be assigned important role in respect of planning, implementation and monitoring of rural development programmes.
6. The Committee recommends the introduction of the concept of district budget. It is desirable that it is brought into being as quickly as possible.
7. The concept of properly prepared district plan is reiterated. The preparation of a proper plan is a pre-requisite for having a process of development which will ensure that the poor are properly taken care of. All the development departments should clearly indicate the activities which they would undertake for assisting the poor.

8. The district plan should include all the resources available both in the plan and non-plan as well as institutional resources.
9. The Committee is of the view that development administration at the district level has to be treated as a major activity involving significant responsibilities and therefore, recommends that a post of District Development Commissioner (DDC) be created to look after and coordinate all the development activities in the district.
10. The DDC may be made the Chief Executive of the ZilaParishad in those states where the Panchayati Raj institutions hold the responsibility for planning and implementation of various development programmes.
11. In those states where ZilaParishad are not in position, the DDC could function as Chairman and Chief Executive of the District Development Council.
12. The office of the DDC should be of a higher status than that of the District Collector in order to establish the primacy of the Development administration over maintenance administration.
13. The Committee recommends that the Chapter Development Office should be the sheet-anchor of the entire rural development process. For this purpose the status of this office should be upgraded. The Chief Executive Officer of the Chapter/tehsil may be designated as Assistant Development Commissioner (ADC). The ADC should be an officer of the status of Sub-Divisional Officer.
14. The ADC should be a dynamic young person, preferably below the age of 35 and in any case not above 40. His background, training, managerial capability and motivation should be appropriate for the task as the leader of a team which will be in-charge of all development functions in the Chapter.
15. On the basis of certain criteria of population, area and terrain, average size of the Chapter may be one lakh population in the plains and 50,000 population in the hilly and difficult terrain and tribal areas.

### **The LM Singhvi Committee**

This committee was constituted in 1986 to study the problems faced by panchayat institutions. This committee was the most important reform in the evolution of the panchayati raj system because it recommended that local self-government should be constitutionally recognised. It highlighted the need to protect and preserve these institutions by the adding a new chapter in the Constitution. It also emphasized on the non-involvement of political parties in village elections.

### **Main Recommendations of Dr.L.M.Singhvi Committee for the Concept paper on Panchayati Raj Institutions (1986)**

1. Village may be reorganized and many of them may in the process be grouped and enlarged in order to make for more viable village panchayats.
2. The Panchayati Raj Institutions have to be viewed as institutions of self-government which would naturally facilitate the participation of the people in the process of planning and development flowing from and as part of the concept of self-government. Development planning should be democratic planning.
3. The operational dynamics of Panchayati Raj should be directed to achieve community and social mobilization, transcending the barriers of caste, religion, sex and disparities of wealth and surmounting social disabilities and disadvantages.

4. Local self-government should be constitutionally recognised, protected and preserved by the inclusion of a new chapter in the Constitution.
5. A Panchayati Raj - Judicial Tribunal to be constituted in each State to adjudicate controversies in relation to elections, suspensions, supersessions, dissolutions, and other matters relating to the working of panchayati Raj institutions and its elected personnel.
6. Ways and means should be found to ensure the, availability of adequate financial resources of Panchayati Raj Institutions to function effectively.

### **Thungon Committee**

This initiative was taken under the leadership of Rajiv Gandhi in 1988. A committee headed by P.K. Thungon recommended that Panchayati Raj bodies should be constitutionally recognized and the Constitution should have a provision to ensure timely and regular election to these bodies and their term should be five years. The 73<sup>rd</sup> and 74<sup>th</sup> amendments to constitutionally set-up local governments were brought in after these recommendations.

### **Main Recommendations of Thungon Committee on Panchayati Raj Institutions (1988)**

1. Panchayati Raj bodies should be constitutionally recognized.
2. A three-tier structure for Panchayati Raj with Village Panchayat at the bottom, district panchayat at the top and mandal Chapter panchayat in the middle, has been recommended where it does not already exist.
3. The Sub-Committee is in favour of a model with the ZilaParishad as the only planning and development agency in the district.
4. ' The Sub-Committee also suggests the setting up of a Planning and Coordination Committee at the State level under the Chairmanship of the Planning Minister. Presidents of the ZilaParishad would be members of the Committee.
5. The judicial functions of the village panchayat are required to be revived so that simple disputes can be sorted out at the village level itself.
6. The Committee has recommended that MPs and MLAs should be suitably associated with ZilaParishad.
7. The elected member of the ZilaParishad, in addition to members like MPs, MLAs, could as a general rule be 5 to 15 in areas with the population of less than 15 lakhs and 15 to 60 in areas with a population of over 15 lakhs.
8. As regards the procedure for the approval of the District Plan, it has been suggested that the District Planning and Coordination Committee at the ZilaParishad should be well equipped and should be able to draw upon the latest technology including computer linking the district with the Divisional Headquarters and the State Capital with a two-way querying system.
9. The suitable constitutional provision be made to ensure timely and regular elections. The elections could be conducted by the Chief Electoral Officers of the State.
10. In case a local body does not function in accordance with law; or grossly abuses its powers, it could be suspended or dissolved by the State Government.' After any dissolution, the State Government will have to bring a Resolution in the State Legislature before the end of the session or within six weeks of the commencement of the session whichever is earlier for approval by the House. In any case, a body should not be superseded for a period of more than six months.

11. The term of Panchayati Raj bodies should be for a period of 5 years. However, the State Government may choose the term depending upon their requirements but this term may not be less than 3 years.
12. It is recommended that a separate Panchayati Raj Judicial Tribunal should be appointed by the State Government to adjudicate controversies in matters which hamper the functioning of these institutions.
13. It is recommended that the system of reservation for all the three-tier of Panchayati Raj bodies should be as per population. In case of areas with the tribal population of more than 30%, the Chairman of the body should be a member from the Scheduled Tribes. Vice-Chairmanship of all the Panchayati Raj bodies should be reserved for a SC or ST member.
14. It is recommended that as a rule not less than two women should be members of Panchayati Raj bodies at each level. In case of bodies of small size with membership upto five there would be only one place reserved for a woman member.
15. Collector/DC should be the pivotal point for both regulatory as well as development administration. Collector should be the Chief Executive Officer of the - ZilaParishad. The State Government should appoint officers of the rank of Additional Collectors to assist the Collector in development and regulatory administration respectively.
16. The Sub-Committee feels that a detailed list of subjects to be dealt with at the district level should be prepared and included in the corresponding schedule of the Constitution.
17. It is recommended that State Government should set up Finance Commissions to lay down the criteria and guidelines whereby resources would be allocated to the districts. 18. Funds should be allocated to the concerned departments like PWD, Irrigation, Public Health, Rural Water Supply, etc. through the ZilaParishad.
18. The Sub-Committee envisage a District Budget where various schemes and projects required in a district are to be taken into account along with contingencies which have not figured in the district budget.
19. A Constitutional provision could be made whereby regular and timely elections to local bodies could be ensured and the various powers and functions of these bodies delineated.
20. The Sub-Committee recommends that the Government of India could also consider formulating a model Panchayat Act. The States could be requested to consider this model Act for adoption.
21. The Sub-Committee felt that the Government of India could also promote Panchayati Raj institutions by giving certain incentives to State Government, e.g. by way of increasing grants-in-aid with reference to financial and other powers devolved upon these institutions by the respective State Government.
22. The Central Government could organize training programmes for both officials and non-officials of local bodies so that they could be fully familiar with the potentialities of these bodies for development administration.

(NOTE This unit is based entirely on content from [http://shodhganga.inflibnet.ac.in/bitstream/10603/72213/17/17\\_appendix%20c.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/72213/17/17_appendix%20c.pdf)  
Source Lok Sabha Unstarred question No.2809 of 1 December, 1988, cited in Parliamentary Research and Information Service, Seminar on Panchayati Raj, Lok Sabha Secretariat, New Delhi, August 4-5, 1989 pp 25-34.)

**To Do Activity** Study the various committees highlighted in this unit and trace the reforms as pointed out in each committee that led to the panchayati raj system as we see it today.

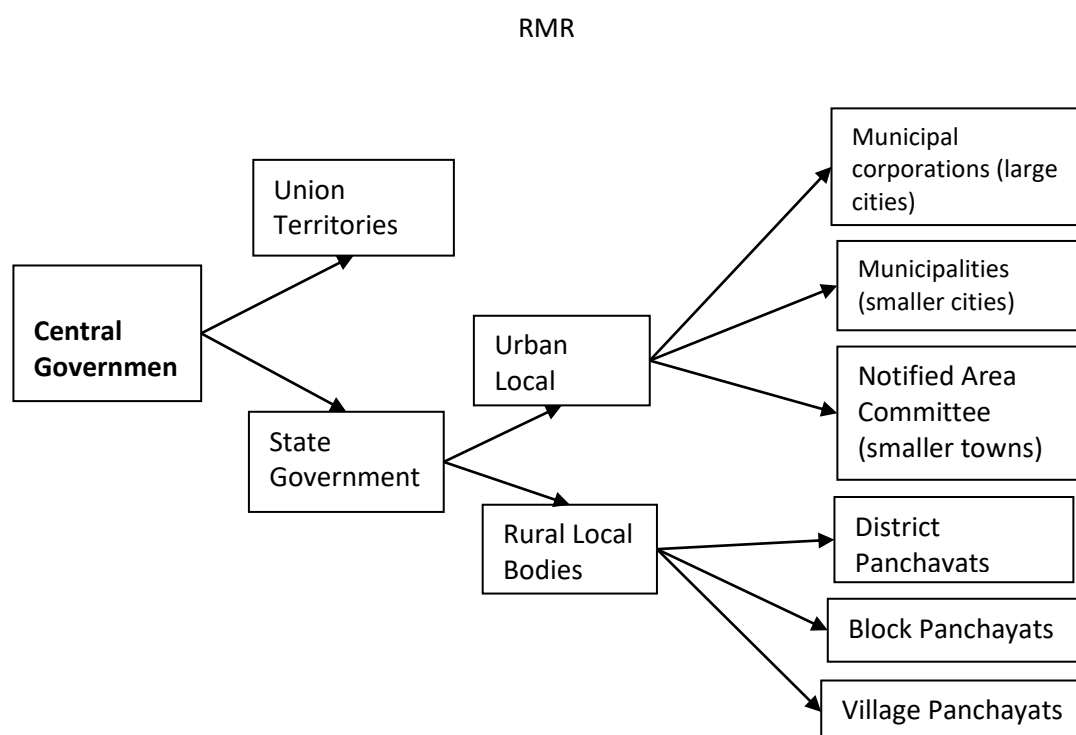
## 2.2 Role of Panchayats

### Decentralization Bringing Governance Closer to the People

The most important role of panchayat institutions is that it brings government close to the people. The government of India has three levels of administration. The first is the Central Government or the Union Government where the President, the Prime Minister and his Cabinet are the main executives. The State governments come next, here, the Chief Ministers and the Governor, appointed by the President of India form the executive pillar of the government. At both levels legislative bodies are also appointed for law-making.

Local governments in India are divided into two types. Cities have urban local bodies or municipalities, smaller towns have notified area committees.

Panchayat bodies work in the villages and as we see further in this Chapter too, they are organized into three tiers within each district- village, Chapter and district levels.



**Figure 2.1 Tiers of Indian Government as per the Constitution of India**

The main role that panchayats have is to coordinate for the governance of their village or Chapter with the higher levels of government. They also serve as implementation agencies for policies formed at union and state government levels.



## **Community Development**

The Community Development Programme was launched after independence and was operational from 1952 to 1957, roughly for five years. The efforts of Albert Mayer in Etawah Pilot Projects may be regarded as the preliminary work which laid the foundation of Community Development in India; and following the recommendations of the Grow Moor Food Inquiry Committee, the Community Development Programme was launched in the country on October 2, 1952.

### **Defining 'Community'**

A group of people living in a geographical area and have similar occupations and cultural affiliations forms a community. It is a form of social organization existing between the family and formal institutions such as governments. A community, while in itself consisting of several parts, is also a part of a larger social system. It is a dynamic social unit which is subject to change of internal or external origin. Some of the important characteristics of the community are-

1. Communities are close-knit
2. Their customs are interrelated
3. These communities are complexes of sub-group relationship and
4. There is a discernible leadership within the community.

### **Defining 'Development'**

The term development connotes growth or maturation. It implies gradual and sequential phases of change. Development can imply social, economic progress or improvement of physical infrastructure in a given area.

### **Concepts of Community Development and Community Development Programmes**

By understanding the above terms, we can say that community development programmes means a programme for gradual change in a group of people living in a geographical area and have interest in each other for the purpose of making a living or improvement in their physical quality of life.

1. Community development is a movement designed to promote better living for the whole community with the active participation and on the initiative of the community.
2. Community development is a balanced programme for stimulating the local potential for growth in every direction. Its promise is of reciprocal advance in both wealth and welfare, not on the basis of outside charity but by building on the latent vitality of the beneficiaries themselves with the minimum of outside aid.
3. Community development is technically aided and locally organized self-help.
4. The term community development has come into international usage to denote the process by which the efforts of the people themselves are united with those the governmental authorities to improve the economic social and cultural conditions of the communities, to integrate these communities into the life of the nation and enable them to contribute fully to national progress.
5. Community development is the term used to describe the technique which many governments have adopted to reach their village people and to make more effective use of local initiative and energy for increased production and better living standards.
6. Community development is a process of social action in which the people of a community organize themselves for planning and action, define their needs and problems.

Community development has now set the pattern for the development of the rural people and the rural areas. The objectives of development and the new approach it makes to the solution of the problem of rural reconstruction, the comprehensive nature of the programme that it is promoting. The approach to the programme is two-fold, educational and organizational. The rural people are to be educated in the art of better living, for bringing about a change in their attitude, for breaking away from primitive methods of production, unhygienic ways of living based on tradition and for the adopting of progressive ways based on science and technology.

### Area Planning

India, since independence, followed planning for economic growth. A Planning Commission (NITI Aayog, since 2015) was set-up for this purpose. State governments also have planning offices. But it is important to note here that these two levels of planning bodies were never given constitutional status. Only district-level planning committees have been granted constitutional status. This implies that their actions are more accountable. These committees work towards planning needs of the region. Member of panchayats also serve in District Planning Committees.

The box below shows constitutional provisions for District Planning Committees-

#### Committee for District Planning

Article 243ZD.

1. There shall be constituted in every State at the district level a District Planning Committee to consolidate the plans prepared by the Panchayats and the Municipalities in the district and to prepare a draft development plan for the district as a whole.
2. The Legislature of a State may, by law, make provision with respect to— (a) the composition of the District Planning Committees; (b) the manner in which the seats in such Committees shall be filled Provided that not less than four-fifths of the total number of members of such Committee shall be elected by, and from amongst, the elected members of the Panchayat at the district level and of the Municipalities in the district in proportion to the ratio between the population of the rural areas and of the urban areas in the district; (c) the functions relating to district planning which may be assigned to such Committees; (d) the manner in which the Chairpersons of such Committees shall be chosen.
3. Every District Planning Committee shall, in preparing the draft development plan,— (a) have regard to— (i) matters of common interest between the Panchayats and the Municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation; (ii) the extent and type of available resources whether financial or otherwise; (b) consult such institutions and organisations as the Governor may, by order, specify.
4. The Chairperson of every District Planning Committee shall forward the development plan, as recommended by such Committee, to the Government of the State

Present PM Sri NarendraModi has started the Gram Panchayat Development Plan. Under this scheme, Gram Panchayats have been mandated for the preparation of Gram Panchayat Development Plan (GPDP) for economic development and social justice utilizing the resources available to them. The GPDP planning process has to be comprehensive and based on participatory

process which involves the full convergence with Schemes of all related Central Ministries / Line Departments related to 29 subjects enlisted in the Eleventh Schedule of the Constitution. Panchayats have a significant role to play in the effective and efficient implementation of flagship schemes on subjects of National Importance for transformation of rural India. The People's Plan Campaign will commence from 2<sup>nd</sup> October to 31<sup>st</sup> December, 2018 for preparing GPDP for 2019-20. The campaign initiated under "SabkiYojanaSabkaVikas" will be an intensive and structured exercise for planning at Gram Sabha through convergence between Panchayati Raj Institutions (PRIs) and concerned Line Departments of the State.

### **Role of Panchayats in Agriculture Planning**

After the 73rd and 74th constitutional amendments, the Panchayati Raj Institution (PRI) is the major driver in the development of rural areas. It acts as a tool for implementation of all developmental schemes that are designed by the government of India or the state governments for specific regions. It is the main planning and executive agency for all kinds of development projects at the village or the gram panchayat level.

To prepare a good quality plan, quality of participation needs to be expanded and conscious efforts have to be made to ensure that every section of society participates in the Gram Sabha with active contributions on discussions towards identifying and prioritizing development issues and suggesting optimum solutions. India is not only has about xx% population living in villages, but a majority of the country's population is also engaged in agriculture and allied sectors.

For this reason, panchayats have an important role in development of the agricultural sector. They need to coordinate with specialists in the field of agriculture policy so that the panchayat can make better participatory micro-plans as it is the most important source of livelihood for the village folks. Involvement of panchayats is important in preparing village level agriculture plans aligned with district vision and district agriculture plans.

### **Judicial Roles of Panchayats**

Delivering justice is an implied primary function of the panchayats as per the constitution's provisions too. But there is still not enough legal clarity about judicial role of this body of local governments in Indian villages. The union law ministry has from time to time emphasized the need regarding the establishment of gram nyalayas.

At present, there is one nyayapanchayat for every three or four villages. Each village panchayat elects a member to the nyayapanchayat. A sarpanch heads the nyayapanchayat. It has a jurisdiction over minor civil and criminal cases.

Nyayapanchayat is a system of dispute resolution at village level in India. It can be endowed with functions based on broad principles of natural justice and can tend to remain procedurally as simple as possible.

#### **To Do Activity**

Using an understanding of the village society and economy from previous study describe what you think are the main roles of panchayats in your area.

### 2.3 Structures and Composition of Panchayati Raj

India's political system saw a major shift in the early years of the decade of 1990s. First, the economy was liberalized. A financial crisis had hit the Indian Government and the World Bank bailed out the government with a loan. But there was a condition to the loan, they economy had to be reformed and LPG- Liberalization, Privatization and Globalization reforms- had to brought in.

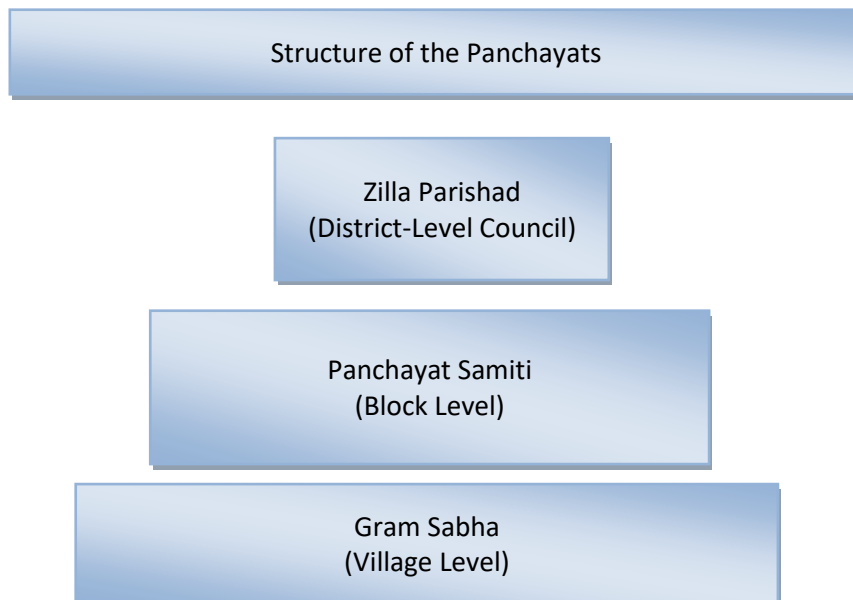
Parallel to these reforms, the central government's control over federal policies had to be reduced. After the recommendations of the LM Singhvi committee and Thungon Committee in 1980s, as we see in unit 2.1 as well, the panchayati raj system was reformed too. The constitution of India was amended and the 73<sup>rd</sup> amendment act, 1992, gave constitutional status to the Panchayati Raj institutions all across India.

#### **Panchayats in India Definitions and Concepts as per the Constitution**

Article 243. In this Part, unless the context otherwise requires,

- (a) "district" means a district in a State;
- (b) "Gram Sabha" means a body consisting of persons registered in the electoral rolls relating to a village comprised within the area of Panchayat at the village level;
- (c) "intermediate level" means a level between the village and district levels specified by the Governor of a State by public notification to be the intermediate level for the purposes of this Part;
- (d) "Panchayat" means an institution (by whatever name called) of self-government constituted under article 243B, for the rural areas;
- (e) "Panchayat area" means the territorial area of a Panchayat;
- (f) "population" means the population as ascertained at the last preceding census of which the relevant figures have been published;
- (g) "village" means a village specified by the Governor by public notification to be a village for the purposes of this Part and includes a group of villages so specified.

The provisions for setting up panchayats and their structures and institutions are mentioned in the Part IX of the Constitution of India, Articles 243 to 243-O. The panchayats are organized into three tiers as depicted in the diagram below-



**Figure 2.2 Structure of Panchayati Raj**  
Structure of Panchayats as directed by the Constitution of India-

**Structure of Panchayats defined in the Constitution**  
 Article 243A. A Gram Sabha may exercise such powers and perform such functions at the village level as the Legislature of a State may, by law, provide.  
 243B. (1) There shall be constituted in every State, Panchayats at the village, intermediate and district levels in accordance with the provisions of this Part.  
 (2) Notwithstanding anything in clause (1), Panchayats at the intermediate level may not be constituted in a State having a population not exceeding twenty lakhs.

After the 73<sup>rd</sup> Amendment of the constitution in 1992, the panchayats in India got institutional status from the highest law in the country. India, like all other democratic countries is also governed by a constitution that highlights in detail how the governments in the country will be run.

It is essential to understand the constitutional provisions regarding the Panchayats to understand their structure and functions. With a constitutional status, Panchayats are guided by the

At the village level, Gram Panchayats are set-up. This council is elected by all the people in the village who are 18 years old and older. The size of the council depends on the population of the village- ranging from 5 to 30 members. This council nominates a gram pradhan or council president, and an up-pradhan, or vice-president. Members serve term for five-years and work towards the many development goals of the village as we will see in the Unit 2.4 on rural administration. Additionally, the pradhan and up-pradhan also work as members of the panchayatsamiti.

The panchayatsamiti functions at the Chapter level of rural administration. It may also be called the 'Chapter samiti'. The Chapter is made up of about 10 villages in a geographic area. This council comprises the elected representatives – the gram pradhan and up-pradhan from the gram panchayats of the villages. Other members include the representatives of different industries in the area, and the Chapter Development Officer (BDO), appointed by the state government to aid the

council in working with the state. Chapter samitis also serve for five years and elect their council chairman and vice-chairman from their ranks to run meetings. The Chapter samitis also send representatives to the higher tier than themselves- the zilla panchayat.

The zillaparishad is the highest tier of the panchayat system is and it represents a distinct district within the state. Members of the zilla parishad are derived from the leaders of the panchayatsamitis within the district. This council, like the lower bodies also elects a chairman and vice-chairman from among the members who serve for a period of four to five years depending on the rules and regulations set in that district. They work directly with the state government and help each Chapter and the villages within the Chapters to provide for the administrative requirements of their people in implementing the regional development programs.

### **Composition of Panchayats as described in the Constitution**

Article 243C. (1) Subject to the provisions of this Part, the Legislature of a State may, by law, make provisions with respect to the composition of Panchayats Provided that the ratio between the population of the territorial area of a Panchayat at any level and the number of seats in such Panchayat to be filled by election shall, so far as practicable, be the same throughout the State.

(2) All the seats in a Panchayat shall be filled by persons chosen by direct election from territorial constituencies in the Panchayat area and, for this purpose, each Panchayat area shall be divided into territorial constituencies in such manner that the ratio between the population of each constituency and the number of seats allotted to it shall, so far as practicable, be the same throughout the Panchayat area.

(3) The Legislature of a State may, by law, provide for the representation—

(a) of the Chairpersons of the Panchayats at the village level, in the Panchayats at the intermediate level or, in the case of a State not having Panchayats at the intermediate level, in the Panchayats at the district level;

(b) of the Chairpersons of the Panchayats at the intermediate level, in the Panchayats at the district level;

(c) of the members of the House of the People and the members of the Legislative Assembly of the State representing constituencies which comprise wholly or partly a Panchayat area at a level other than the village level, in such Panchayat;

(d) of the members of the Council of States and the members of the Legislative Council of the State, where they are registered as electors within— (i) a Panchayat area at the intermediate level, in Panchayat at the intermediate level; (ii) a Panchayat area at the district level, in Panchayat at the district level.

(4) The Chairperson of a Panchayat and other members of a Panchayat whether or not chosen by direct election from territorial constituencies in the Panchayat area shall have the right to vote in the meetings of the Panchayats.

(5) The Chairperson of—

(a) apanchayat at the village level shall be elected in such manner as the Legislature of a State may, by law, provide; and

(b) aPanchayat at the intermediate level or district level shall be elected by, and from amongst, the elected members thereof.

### **To Do Activity**

Visit your local panchayat body and draw a flowchart of the organisation and composition.

## **2.4 Rural Administration**

### **Ministry of Rural Development at the Union Government**

The Government of India at present (in 2019) has a Ministry of Rural Development. This ministry has two departments- Department of Rural Development and Department of Land Resources. The ministry is responsible for designing and ensuring implementation various schemes for rural development and coordinating with the panchayats.

Rural development implies both the economic betterment of people as well as greater social transformation. In order to provide the rural people with better prospects for economic development, increased participation of people in the rural development programmes, decentralization of planning, better enforcement of land reforms and greater access to credit are envisaged.

On 31st March 1952, an organization known as Community Projects Administration was set up under the Planning Commission to administer the programmes relating to community development. The community development programme inaugurated on October 2, 1952, was an important landmark in the 97 history of the rural development. This programme underwent many changes and was handled by different Ministries.

In October 1974, the Department of Rural Development came into existence as a part of Ministry of Food and Agriculture. On 18th August 1979, the Department of Rural Development was elevated to the status of a new Ministry of Rural Reconstruction. That Ministry was renamed as Ministry of Rural Development on 23rd January 1982. In January 1985, the Ministry of Rural Development was again converted into a Department under the Ministry of Agriculture and Rural Development which was later rechristened as Ministry of Agriculture in September 1985. On July 5, 1991 the Department was upgraded as Ministry of Rural Development.

### **Reservation in Panchayats**

There is a provision of reservation of seats for SCs and STs at every level of Panchayat in proportion to the population of the communities in the region.

One-third of the total seats are to be reserved for women in each panchayat.

This was a bold step that the reforms made towards the empowerment of women and backward communities at village level. The constitutional provisions for reservation can be studied from the box below-



### **Reservation of Seats in Panchayats**

Article 243D. (1) Seats shall be reserved for—

- (a) the Scheduled Castes; and
- (b) the Scheduled Tribes,

in every Panchayat and the number of seats so reserved shall bear, as nearly as may be, the same proportion to the total number of seats to be filled by direct election in that Panchayat as the population of the Scheduled Castes in that Panchayat area or of the Scheduled Tribes in that Panchayat area bears to the total population of that area and such seats may be allotted by rotation to different constituencies in a Panchayat.

(2) Not less than one-third of the total number of seats reserved under clause (1) shall be reserved for women belonging to the Scheduled Castes or, as the case may be, the Scheduled Tribes.

(3) Not less than one-third (including the number of seats reserved for women belonging to the Scheduled Castes and the Scheduled Tribes) of the total number of seats to be filled by direct election in every Panchayat shall be reserved for women and such seats may be allotted by rotation to different constituencies in a Panchayat.

(4) The offices of the Chairpersons in the Panchayats at the village or any other level shall be reserved for the Scheduled Castes, the Scheduled Tribes and women in such manner as the Legislature of a State may, by law, provide Provided that the number of offices of Chairpersons reserved for the Scheduled Castes and the Scheduled Tribes in the Panchayats at each level in any State shall bear, as nearly as may be, the same proportion to the total number of such offices in the Panchayats at each level as the population of the Scheduled Castes in the State or of the Scheduled Tribes in the State bears to the total population of the State Provided further that not less than one-third of the total number of offices of Chairpersons in the Panchayats at each level shall be reserved for women Provided also that the number of offices reserved under this clause shall be allotted by rotation to different Panchayats at each level.

(5) The reservation of seats under clauses (1) and (2) and the reservation of offices of Chairpersons (other than the reservation for women) under clause (4) shall cease to have effect on the expiration of the period specified in article 334.

(6) Nothing in this Part shall prevent the Legislature of a State from making any provision for reservation of seats in any Panchayat or offices of Chairpersons in the Panchayats at any level in favour of backward class of citizens.

### **Financial Administration**

Panchayats in India do not have direct fund-generation capacity. But the state government may make laws to empower the panchayats financially.

Panchayats, can be empowered to impose taxes to levy, collect and appropriate suitable local taxes. They may also be assigned the power of making grants-in-aid to the panchayats from the consolidated fund of the state. But at every step, the State government has to make sure that the panchayats discharge their functions smoothly with adequate finance at their disposal.



### **Powers to impose taxes by and Funds of the Panchayats**

Article 243H. The Legislature of a State may, by law,—

- (a) authorize a Panchayat to levy, collect and appropriate such taxes, duties, tolls and fees in accordance with such procedure and subject to such limits;
- (b) assign to a Panchayat such taxes, duties, tolls and fees levied and collected by the State Government for such purposes and subject to such conditions and limits;
- (c) provide for making such grants-in-aid to the Panchayats from the Consolidated Fund of the State; and
- (d) provide for constitution of such Funds for crediting all moneys received, respectively, by or on behalf of the Panchayats and also for the withdrawal of such moneys therefrom, as may be specified in the law.

**Audit of Accounts** The state legislatures (VidhanSabhAs in states) have been given the power to make provisions in respect of the maintenance of accounts by the Panchayats and they are also responsible for auditing of their accounts. **State Finance Commission** This body is constituted at the State level. Its main function is to review the financial position of Panchayats once in every five years. It also recommends to the state the pattern of distribution of funds between the state government and the Panchayat bodies.

### **State Finance Commission and Audit of Panchayat Accounts**

Article 243-I. (1) The Governor of a State shall, as soon as may be within one year from the commencement of the Constitution (Seventy-third Amendment) Act, 1992, and thereafter at the expiration of every fifth year, constitute a Finance Commission to review the financial position of the Panchayats and to make recommendations to the Governor as to—

- (a) the principles which should govern— (i) the distribution between the State and the Panchayats of the net proceeds of the taxes, duties, tolls and fees leviable by the State, which may be divided between them under this Part and the allocation between the Panchayats at all levels of their respective shares of such proceeds; (ii) the determination of the taxes, duties, tolls and fees which may be assigned to, or appropriated by, the Panchayats; (iii) the grants-in-aid to the Panchayats from the Consolidated Fund of the State;
- (b) the measures needed to improve the financial position of the Panchayats;
- (c) any other matter referred to the Finance Commission by the Governor in the interests of sound finance of the Panchayats.

(2) The Legislature of a State may, by law, provide for the composition of the Commission, the qualifications which shall be requisite for appointment as members thereof and the manner in which they shall be selected. (3) The Commission shall determine their procedure and shall have such powers in the performance of their functions as the Legislature of the State may, by law, confer on them. (4) The Governor shall cause every recommendation made by the Commission under this article together with an explanatory memorandum as to the action taken thereon to be laid before the Legislature of the State.

Article 243J. The Legislature of a State may, by law, make provisions with respect to the maintenance of accounts by the Panchayats and the auditing of such accounts.

**State Election Commission** Elections to the Panchayats are conducted regularly under the overall supervision of the State Election Commission. The Election Commissions are headed by a State Election Commissioner, who shall be appointed by the Governor in each state.

### **Panchayat Elections, Duration of Term and Disqualification of Membership**

Article 243K. (1) The superintendence, direction and control of the preparation of electoral rolls for, and the conduct of, all elections to the Panchayats shall be vested in a State Election Commission consisting of a State Election Commissioner to be appointed by the Governor.

(2) Subject to the provisions of any law made by the Legislature of a State, the conditions of service and tenure of office of the State Election Commissioner shall be such as the Governor may by rule determine Provided that the State Election Commissioner shall not be removed from his office except in like manner and on the like grounds as a Judge of a High Court and the conditions of service of the State Election Commissioner shall not be varied to his disadvantage after his appointment.

(3) The Governor of a State shall, when so requested by the State Election Commission, make available to the State Election Commission such staff as may be necessary for the discharge of the functions conferred on the State Election Commission by clause (1).

(4) Subject to the provisions of this Constitution, the Legislature of a State may, by law, make provision with respect to all matters relating to, or in connection with, elections to the Panchayats.

Article 243E. (1) Every Panchayat, unless sooner dissolved under any law for the time being in force, shall continue for five years from the date appointed for its first meeting and no longer.

(2) No amendment of any law for the time being in force shall have the effect of causing dissolution of a Panchayat at any level, which is functioning immediately before such amendment, till the expiration of its duration specified in clause (1).

(3) An election to constitute a Panchayat shall be completed— (a) before the expiry of its duration specified in clause (1); (b) before the expiration of a period of six months from the date of its dissolution Provided that where the remainder of the period for which the dissolved Panchayat would have continued is less than six months, it shall not be necessary to hold any election under this clause for constituting the Panchayat for such period.

(4) A Panchayat constituted upon the dissolution of a Panchayat before the expiration of its duration shall continue only for the remainder of the period for which the dissolved Panchayat would have continued under clause (1) had it not been so dissolved.

Article 243F. (1) A person shall be disqualified for being chosen as, and for being, a member of a Panchayat— (a) if he is so disqualified by or under any law for the time being in force for the purposes of elections to the Legislature of the State concerned Provided that no person shall be disqualified on the ground that he is less than twenty-five years of age, if he has attained the age of twenty-one years; (b) if he is so disqualified by or under any law made by the Legislature of the State. (2) If any question arises as to whether a member of a Panchayat has become subject to any of the disqualifications mentioned in clause (1), the question shall be referred for the decision of such authority and in such manner as the Legislature of a State may, by law, provide.

### **Powers and Functions of Panchayats**

The Eleventh Schedule, added by the Constitution (Seventy-third Amendment) Act, 1992 highlights the outlines the subjects relating to the powers, authority and responsibilities of the panchayats. These powers are granted under article 243 G of the constitution of India.

The twenty-nine matters of jurisdiction for panchayats under the Eleventh Schedule are listed in the box below-

### **Powers, Authority and Responsibilities of Panchayats**

Article 243G. Subject to the provisions of this Constitution, the Legislature of a State may, by law, endow the Panchayats with such powers and authority as may be necessary to enable them to function as institutions of self-government and such law may contain provisions for the devolution of powers and responsibilities upon Panchayats at the appropriate level, subject to such conditions as may be specified therein, with respect to—

- (a) the preparation of plans for economic development and social justice;
- (b) the implementation of schemes for economic development and social justice as may be entrusted to them including those in relation to the matters listed in the Eleventh Schedule.

### **Eleventh Schedule**

(Article 243G)

1. Agriculture, including agricultural extension.
2. Land improvement, implementation of land reforms, land consolidation and soil conservation.
3. Minor irrigation, water management and watershed development.
4. Animal husbandry, dairying and poultry.
5. Fisheries.
6. Social forestry and farm forestry.
7. Minor forest produce.
8. Small scale industries, including food processing industries.
9. Khadi, village and cottage industries.
10. Rural housing.
11. Drinking water.
12. Fuel and fodder.
13. Roads, culverts, bridges, ferries, waterways and other means of communication.
14. Rural electrification, including distribution of electricity.
15. Non-conventional energy sources.
16. Poverty alleviation programme.
17. Education, including primary and secondary schools.
18. Technical training and vocational education.
19. Adult and non-formal education.
20. Libraries.
21. Cultural activities.
22. Markets and fairs.
23. Health and sanitation, including hospitals, primary health centres and dispensaries.
24. Family welfare.
25. Women and child development.
26. Social welfare, including welfare of the handicapped and mentally retarded.
27. Welfare of the weaker sections, and in particular, of the Scheduled Castes and the Scheduled Tribes.
28. Public distribution system.
29. Maintenance of community assets

### **To Do Activity**

Make a list of the schemes launched by the Ministry of Rural Development, Government of India and chalk out the role of district administration in implementing each scheme.

## 2.5 Relationship with Bureaucracy

District was an important unit of administration during the British rule, mainly for revenue collection. Even after independence, the district and the bloc are important for administration.

### District Bureaucracy

The rural administration is managed by bureaucrats or government officials that can be categorized under four heads-

**1-Police** The police in village help in maintaining law and order.

**2-Patwari (Land Measurer)** The Patwari holds a record of land measures and solves disputes regarding boundaries.

**3-Tehsildar or Talukdar** These people supervise the work of Patwaris mentioned above. They also look at the general law and order of their areas and solve disputes that arise. These officers are also in charge of handing out community certificates to villagers, like a Schedule Tribe certificate.

**4-District Collector or District Magistrate** These officers are the head of a district in each state. They supervise the overall functioning of the district. A majority of them get the position by clearing the tough Union Public Service Commission exam for Indian Administrative Services.

### District Rural Development Agency

Every district in India with rural population has a District Rural Development Agency or DRDA. The DRDA is the principal organ at the district level to manage and oversee the implementation of different anti-poverty schemes of the Ministry of Rural Development. It is a supporting and facilitating organization which plays a very effective role as a catalyst in development process.

The DRDA may be differently organized in each district according to the needs of the region. The DRDA is one agency in rural administration where panchayat officials and bureaucrats work together, along with other policy implementation bodies and technical staff.

The DRDA in India has been set up by the Ministry of Rural Development. This agency was created originally to implement the Integrated Rural Development Programme (IRDP) in 1980s. Later the DRDAs were entrusted with number of programmes of both state and central governments. Since April 1999 a separate DRDA Administration has been introduced to take care of the administrative costs. This has been done to strengthen the DRDAs and make them more professional in managing the anti-poverty programmes and be an effective link between the ministry at the top levels and the districts at grassroots.

Decentralisation of Rural development and poverty alleviation programmes is essential, keeping in view the large geographical areas, the administrative requirements and the need to involve grassroots-level officials and the community in the implementation of the programmes. At the District level, the programmes are implemented through the DRDAs. The governing body of DRDA can include Members of Parliament (MPs), Members of Legislative Assemblies (MLAs), District level officials of Development Departments, Bankers, NGO's and representatives of weaker sections of the society. The District Collector used to be (but not always at present) the Chairman of the Governing Board. The Governing body at the district level provides guidance and directions to DRDA. The body in DRDA responsible for actual implementation is headed by an Additional District Collector.

Many Schemes of the Central and State Governments are introduced from time to time towards rural development. Several schemes are available providing support to different components of Rural Development such as poverty alleviation or agriculture development or rural roads. Schemes

are also periodically modified on the basis of experience over the years. The task of DRDA has been to identify the region-specific the needs of the village population and reach the appropriate schemes where they are needed. In implementing the schemes, the role of the DRDA has been Technical, Managerial and Financial. Thus DRDA is not only a body to disburse the funds for the schemes but also provide appropriate Managerial and Technical support.

Since each DRDA is organized according to local needs of development, the way the relationships between bureaucracy and panchayats will shape up depends from region to region.

### **Coordination Problems Faced by Panchayats**

Some factors that lead to problems in functioning and coordination at panchayati raj can be identified as follows-

1. domination of panchayati raj institutions by elite groups from villages with vested interests
2. operational significance to those institutions with non-elected members, mainly gram sabha has become a mere okaying body in most states and non-elected members such as bureaucrats have bigger powers
3. heavy dependence on the state government for finances
4. domination of political class over bureaucracy

But any study on the structure and evolution of the panchayati raj system in India and its success is incomplete without a deeper and more thorough understanding of the forms of economic domination by certain classes in the Indian rural society. The four factors listed above are the biggest challenges before panchayats in India.

#### **To Do Activity**

Make an organisational chart of the DRDA from your district.

### **Summary**

This Chapter focused on rural self-governments in India. Decentralization has been an important narrative in administrative reforms in India since independence. Strong local governments contribute towards more participatory democracy and governance among community. At the same time it helps in socio-economic development of the region.

This Chapter shows the legal aspects of the structure, composition and functions of the panchayats in India by citing them from the constitution. Constitutional status to panchayat bodies means that they were legally empowered. But at the same time we see in this Chapter how limited control over finances and elitism in local society and bureaucracy makes panchayat bodies less powerful.

### **Model Questions**

1. 1-What have been the five biggest reforms in the panchayati raj in India since independence?
2. 2-Describe the election and structure of panchayats.
3. 3-List five most important functions of panchayats as defined in the constitution of India.
4. 4-What are the problems panchayats face

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# Chapter 3

## Fundamentals of Rural Demography and Economics

### Introduction

This Chapter will introduce a basic understanding of the field of Demography to the readers. Understanding of demography is important because it is a science that helps understand people, their age groups, gender composition, economic engagements and living standards. Different countries of the world collect socio-economic data in various ways.

In India, there are two main agencies that conduct surveys on population- the Office of the Registrar General and Census Commissioner that holds Census on India survey every decade and the National Sample Survey Organization that conduct household level surveys to measure the socio-economic indicators of the country.

The Sample Registration Survey or SRS also keeps a record of health indicators, especially women and child healthcare through infant and maternal mortality data. Other than this, the government of India conducts the National Family and Health Surveys from time to time at household levels.

The Reserve Bank of India and the Planning Commission (now NITI Aayog) are also been important sources of data and research on economic indicators for India.

This Chapter will focus on understanding demographic terminology and its implications for the socio-economic policy in the context of rural India.

### Objectives

- Studying basic concepts of demography to study populations
- Analyzing demographic transition of rural India
- Understanding the linkages between demographic and economic indicators
- Exploring policy implications for rural India due to demographic transition

### Structure

Fundamentals of Rural Demography and Economics	
3.1	Fundamentals of Demography
3.2	Demographic transition in Rural India
3.3	Rural Poverty
3.4	Rural Economy
3.5	Challenges and Opportunities

### **3.1 Fundamentals of Demography**

In order to understand policy needs it is first important to understand the people. A study of Demography helps in systematically understanding the population of a particular region. This helps in policy-making for the region.

#### **Introduction to Demography**

The field of demography can be broadly divided into five topics

- The size of the population;
- Its distribution across geographic areas;
- Its composition (e.g., age, sex, race, and other characteristics);
- Changes in population size, distribution, and composition over time and
- The determinants and consequences of population growth

Etymologically, 'demos' is the Greek root which means 'people' and 'graphy' in English literally means 'a written representation of'. Demography, thus, is the study of people. It involves statistical study of populations. It helps us understand transitions within populations over time. It can involve birth and death rates, life expectancy, diseases and health, gender composition, racial and ethnic compositions, distribution of age groups.

The term demography was coined by a seventeenth century English haberdasher and statistician. With his friend William Petty, he developed census methods after witnessing a rise in death due to plague in seventeenth century England.

In-depth study of demography can also help understand socio-economic transitions. Socio-economic transitions that Indian Census surveys have included in the study are data on religious minorities, backward castes and tribal populations, occupation, income and education levels, household data. An understanding of demography is helpful for policy-making. Let us see how various broad divisions of demography can help us understand rural lives in India.

#### **Population Size**

The size of a population matters because it gives us an understanding of how many people live in a particular area. When we know how many people live in a particular area over time, we can calculate population density, population growth (or decline), death rates and birth rates.

All these aspects help in designing policy for a particular region. Policies could be related to installation of public infrastructure such as schools, hospitals, roads or bridges or making policies for health and economic needs of the people of a particular region. Understanding trends in rates of population growth and death rates help in designing of health policies.

#### **Geographical Distribution of Population**

Geographical distribution of population can relate to political division- for example, distribution of population among states of India. It can be related to rural or urban distribution or it can be in relation to physical geography of a region.



### **Composition of Population**

Composition of the population hints at gender composition, age composition, compositions of various minority communities- in the case of India, minority communities refers to religious communities. Census of India also collects data on socially backward communities such as the Scheduled Castes and Scheduled Tribes.

Composition of population indicated socio-economic needs of the region. If a region has high concentration of backward population, policies need to focus on welfare of the society. If a region shows poor sex ratio for women, the policy focus has to be on gender-focused schemes. Lesser people in the working-age group (15 to 59 years in India) implies more dependency on the working population of younger or older people.

### **Transition of Population**

Transition of population can be understood in terms of decrease or increase in growth or birth or death rates, transition from rural to urban population or socio-economic transition in terms of occupation and income.

The "Demographic Transition" is a model that describes population change over time. It is based on an interpretation from 1929 by an American demographer named Warren Thompson, who observed changes, or 'transitions', in birth and death rates in industrialized societies over the past two hundred years or so. This led to the expansion of the field as it helped policymakers predict or estimate changes in population by observing trends to plan for the future.

### **Understanding Population Growth**

The population of a country or area grows or declines through the interaction of three demographic factors fertility, mortality, and migration. To project future population, demographers make assumptions about how the current rates of births, deaths, and immigration and emigration will change in the future. Based on these assumptions, age- and sex-specific population increases or decreases over a future period are calculated and added to census results or an estimate of the population at the beginning of the period.

Policymakers and economic planners have to rely on population projections to assess future demand for resources such as food, water, and energy, as well as services such as health and education. Projections alert policymakers and planners to major trends that may affect social and economic development and help them craft appropriate policies and programs.

#### **To Do Activity**

Study the Census records of India from 1951 and highlight the changes in census methodologies to study transition of rural societies.

### Demography Glossary of Terms

**Birth Rate** The Crude Birth Rate represents births in a given year for every 1000 persons.

**Death Rate** The Crude Death Rate represents deaths in a given year per 1000 people.

**Natural Change and Rate of Natural Change in Population** Natural change in population is the difference between births and deaths. It does not include the effects of migration. Including the effects of migration (both in and out) would give us Total Change. The difference between natural and total change can be important in countries that are experiencing significant migration and one should be careful when reading data to be sure which they represent.

**Fertility** The total fertility rate is the average number of children that would be born to a woman during her lifetime if she were to pass through her childbearing years conforming the age-specific fertility rates of the year in which she turned fifteen. Fertility across the world is correlated with a number of factors. These include age of marriage; female literacy; childhood mortality.

**Replacement fertility** The level of fertility at which a cohort of women on the average are having only enough children to replace themselves and their partner in the population. By definition, "replacement" is considered only to have occurred when the offspring reach 15 yrs. In The United States and other industrialized countries, a TFR of 2.1 is considered to be replacement level (more than 2.0 to allow for childhood mortality).

**Doubling time** Doubling time is the number of years it will take to double the present population given its present rate of growth. This time is approximated by dividing "70" by the per cent rate of increase.

**Survivorship curve** Survivorship curves keep track of the fate of any given birth cohort. They show the per cent still living at a given age. Nowadays in the developed world few children die before reproduction.

**Population pyramid** A bar chart that shows the age and sex distribution of members of a population. The age divisions are referred to as "cohorts" and may be in 5 or 10 year increments, depending on the level of detail desired. By convention, females are always plotted to the right, males to the left. The units across the base may be either absolute numbers or per cent of the population.

**Population momentum** Population momentum refers to the tendency for population growth to continue beyond the time that replacement-level fertility has been achieved because of a highly relatively high concentration of people in the childbearing years.

**Age Structure** The proportion of the total population in each age group.

**Dependency Ratio** A dependency ratio is the ratio of people in a dependent age group (those under age 15 or ages 65 and older) to those in the economically productive age group (ages 15 to 64) of a population. For instance, a child dependency ratio of 0.45 means there are 45 children for every 100 working-age adults.

**Infant Mortality Rate** The number of deaths of infants under age 1 per 1,000 live births in a given year.

**Life Expectancy** The average number of additional years a person could expect to live if current mortality trends were to continue for the rest of that person's life. Most commonly cited as life expectancy at birth.

**Median Age** The age that divides a population into two numerically equal groups; that is, half the people are younger than this age and half are older.

**Migration** The movement of people across a specified boundary for the purpose of establishing a new or semi-permanent residence. Divided into international migration (migration between countries) and internal migration (migration within a country).

**“Population Explosion” (or “Population Bomb”)** Expressions used to describe the 20th century worldwide trend of rapid population growth, resulting from a world birth rate much higher than the world death rate.

**Population Projection** Computation of future changes in population numbers, given certain assumptions about future trends in the rates of fertility, mortality, and migration. Demographers often issue low, medium, and high projections of the same population, based on different assumptions of how these rates will change in the future.

**Sex Ratio** The number of females per 1000 males in a population (As used in Indian Census).

**Zero Population Growth** A population in equilibrium, with a growth rate of zero, achieved when births plus immigration equal deaths plus emigration.

(Sources Population Reference Bureau, Washington DC, USA; University of Wisconsin Colleges, Madison, USA)

### **3.2 Demographic Transition in Rural India**

#### **Urbanization Trends in India**

About sixty-nine per cent of India’s population lived in villages according to 2011 census estimates. About a hundred years ago in 1911, almost ninety per cent of the population was rural.

The transition of India’s population has been a gradual shift. Rural population, according to census methodologies of estimation implies those populations who are engaged in agricultural activities and live in areas governed by panchayats.

Recall from Chapter 1, an urban unit or a town is defined as “any place with a municipality, corporation, cantonment board or notified town area committee, etc”. These are also called ‘Statutory Towns’. All other places which satisfy the following criteria are known as ‘Census Towns’ as per the definitions used by the census surveys-

- A minimum population of 5,000
- At least 75 per cent of the male main workers engaged in non-agricultural pursuits
- A density of population of at least 400 per sq. km.

Rural Areas are all areas which are not categorized as urban area under the definitions above, according to Census definitions.

Table below shows proportion of rural and urban population of India Since 1901.

**Table 3.1 Population of India Rural-Urban**

Census Year	Proportion of Rural Population	Proportion of Urban Population
1901	89.2	10.8
1911	89.7	10.3
1921	88.8	11.2
1931	88.0	12.0
1941	86.1	13.9
1951	82.7	17.3
1961	82.0	18.0
1971	80.1	19.9
1981	76.7	23.3
1991	74.3	25.7
2001	72.2	27.8
2011	68.8	31.2

Source Census of India

### Transition of Rural to Urban Areas and Migration from Rural Areas

Recall from Chapter 1, according to the 2011 Census data, 68.8 per cent of India's population is rural. Further, 72.4 per cent of workforce in India also lives in villages. Though, the 2011 census has shown a decline of 5.9 per cent points in rural population growth and an increase of 0.3 per cent points in urban population growth from the 2001 census.

**Table 3.2 Indian Population Growth Rate**

Growth Rate of Population (in per cent)			
	1991-2001	2001-2011	Difference
India	21.5	17.6	-3.9
Rural	18.1	12.2	-5.9
Urban	31.5	31.8	+0.3

Source Census of India

This implies a trend of urbanization. Urbanization trend, to put in simple words, can take place in two ways- one, when rural population migrate to cities and two, when villages transform to urban areas and are reclassified. Studies estimate that more than half of the increase in population in urban India during this period can be attributed to the migration from rural to urban areas and reclassification of rural settlements into urban rather than natural increase (Pradhan 2013).

However, demographic projections by the United Nations (2012) estimates do show that India will continue to be predominantly rural till the year 2050. Urban population is estimated to overtake the rural population after this marking year.

There has been regional or state-wise variation in rural population from 2001 census to 2011 in India. During the 2001-11 decade the growth of population living in villages was estimated at 12.2 per cent. Growth of rural population has been estimated to be steadily declining in India since 1991.

### Socio-Economic Characteristics of Rural Population

Rural India had been lagging behind from urban India in terms of socio-economic development. But due to focused policies of the government there has been some improvement in the development indicators in recent times. For example, in the past decade (2001-2011), there was a 14% rise in literacy rates in rural India.

### Literacy Rates in Post Independent India

**Table 3.3 Literacy Rates in India (1951-2011)**

Year	Rural			Urban			Combined		
	Female	Male	Total	Female	Male	Total	Female	Male	Total
1951	4.87	19.02	12.1	22.33	45.6	34.59	8.86	27.15	18.32
1961	10.1	34.3	22.5	40.5	66	54.4	15.35	40.4	28.31
1971	15.5	48.6	27.9	48.8	69.8	60.2	21.97	45.96	34.45
1981	21.7	49.6	36	56.3	76.7	67.2	29.76	56.38	43.57
1991	30.17	56.96	36	64.05	81.09	67.2	39.29	64.13	52.21
2001	46.7	71.4	59.4	73.2	86.7	80.3	53.67	75.26	64.83
2011	58.75	78.57	67.8	79.92	89.67	84.1	65.46	82.14	74.04
% Increase in 2011 over 2001	26%	10%	14%	9%	3%	5%	22%	9%	14%

Source Census of India, Office of Registrar General, India. For 1951, the population male , female and persons refers to effective literacy rates and the break-up of Rural, Urban and male- female components are crude literacy rates.

Notes 1. Literacy rates for 1951, 1961 and 1971 relate to population aged 5 years and above whereas literacy rates for 1981, 1991, 2001 and 2011 relate to the population aged 7 years and above. 2. The 1981 literacy rates exclude Assam where the 1981 Census could not be conducted. 3. The 1991 literacy rates exclude Jammu & Kashmir where the 1991 Census could not be conducted due to disturbed conditions. 4. The 2001 and 2011 literacy rates exclude Mao Maram, Paomata and Purul Sub-divisions of Senapat district of Manipur.

Data Source Ministry of Statistics and Program Implementation

Though, literacy indicators for rural India are improving, the social backwardness in rural areas is still higher than urban areas. Recall from Chapter 1, 1.2, the proportion of the Scheduled Caste (SC) population in villages is 19 per cent, compared to 13 per cent in cities. Also, mostly tribal populations live in villages. The proportion of STs in villages is 11 per cent compared to 3 per cent in cities. The Indian social structure has been historically affected by the presence of the caste system. In most cases, people belonging to lower castes have faced social exclusion and untouchability in extreme cases. The government policy has taken many steps to improve the status of those considered backward because of their caste.

**Table 3.4 Proportion of Scheduled Castes and Scheduled Tribes Population (in per cent)**

Scheduled Castes			Scheduled Tribes		
Total Persons			Total Persons		
Total	Rural	Urban	Total	Rural	Urban
17	19	13	9	11	3

Source Census 2011; Figures are rounded off

### Health Indicators

National Family Health Survey (NFHS) gathers household data on day-to-day health practices, using sample survey techniques. So far, there have been four NFHS rounds since 1992 and the fifth one is being carried out.

These surveys are important indicators of rural health and hygiene practices and help understand policy impact and future recommendations.

### National Family Health Survey-4 Key Statistics

**Table 3.5 Health Indicators in India (2015-16)**

Indicators	NFHS-4 (2015-16)			NFHS-3 (2005-06)
	Urban	Rural	Total	Total
1. Population (female) age 6 years and above who ever attended school (%)	80.6	63.0	68.8	58.3
2. Population below age 15 years (%)	24.9	30.5	28.6	34.9
3. Sex ratio of the total population (females per 1,000 males)	956	1,009	991	1,000
4. Sex ratio at birth for children born in the last five years (females per 1,000 males)	899	927	919	914
5. Children under age 5 years whose birth was registered (%)	88.8	76.1	79.7	41.2
6. Households with electricity (%)	97.5	83.2	88.2	67.9
7. Households with an improved drinking-water source <sup>1</sup> (%)	91.1	89.3	89.9	87.6
8. Households using improved sanitation facility <sup>2</sup> (%)	70.3	36.7	48.4	29.1
9. Households using clean fuel for cooking <sup>3</sup> (%)	80.6	24.0	43.8	25.5
10. Households using iodized salt (%)	96.5	91.4	93.1	76.1
11. Households with any usual member covered by a health scheme or health insurance (%)	28.2	28.9	28.7	4.8

1 Piped water into dwelling/yard/plot, public tap/standpipe, tube well or borehole, protected dug well, protected spring, rainwater, community RO plant. 2 Flush to piped sewer system, flush to septic tank, flush to pit latrine, ventilated improved pit (VIP)/biogas latrine, pit latrine with slab, twin pit/composting toilet, which is not shared with any other household. 3 Electricity, LPG/natural gas, biogas.

Source National Family and Health Survey (NFHS-4)

The chart from NFHS-4 above also shows transition from NFHS-3, conducted a decade prior to this last survey. In 2015-16, rural households showed poor toilet and cooking gas facilities and this helped the government to speed up sanitation policies under Swachh Bharat Mission and the distribution of gas connection to every household.

### Rural to Urban Transition Trends in India

Recall from Chapter 1, because of lesser opportunities, the rate of out-migration from villages of rural to urban migration is high in India. "Although rural to urban migration has been the dominant component of urbanization in the western countries, India has experienced rapid urban population

growth as a result of higher contribution of urban natural increase. In the decade preceding the Census 2011, net rural to urban classification in India contributed about one-third to urban population growth compared one-fourth by net rural to urban migration” (Bhagat, 2012). In another paper Prof Bhagat (2017) has shown how migration helps foster development as migrants from villages to urban areas learn more skills and are pulled out of poverty.

Policies in India are often aimed at reducing rural to urban migration and tend to not include migration as an important factor in economic development. For reducing migration, rural areas are developed in a way to convert to urban areas.

#### **To Do Activity**

From the latest census records, pull out the districts of India with the highest ratio of rural population.

### **3.3 Rural Poverty**

At the time of independence, India suffered an economic drain due to the colonial policies of utilizing the country’s resources for industrial production in Britain. As a result, India’s population was mostly left with traditional occupations.

At the time of independence, India followed a path of planned economic development and the government took charge of industrializing the economy and ensuring that the fruits of economic development reach the poorest people. The Planning Commission (now NITI Aayog) was set up in 1950 to undertake this task. Over the years, this institution, with the help of economists, came devised various methods to measure poverty to make policies for eradication. Let us see how poverty is measured in India and where does rural India stand in poverty statistics.

#### **Poverty Estimation in India and Difference in Rural-Urban Measurements**

Poverty estimates became popular with the YK Alagh’s task force. To paraphrase the methodology, the average calorie requirements from food intake were estimated- separately for rural and urban demographics. Weighted averages of the age-gender-activity specific calorie intake were recommended by the 1968 Nutrition Expert Group, using the 1971 population Census as reference. The estimated calorie norm was set at 2400 kcal per capita per day for population in villages and 2100 kcal per capita per day in urban areas. To work out the monetary equivalent of these norms, 28th Round (1973-74) NSS data relating to household consumption both in quantitative and value terms were used.

Based on the observed consumer behaviour in 1973-74 it was estimated that, on an average, consumer expenditure (food and non-food) of Rs.49.09 per capita per month was associated with a calorie intake of 2400 per capita per day in rural areas and Rs.56.64 per capita per month with a calorie intake of 2100 per day in urban areas. This Monthly Per Capita Expenditure (MPCE) was termed as poverty line. The poverty lines for later years were estimated by updating the poverty lines of the year 1973-74 for price changes.

The methodology to measure poverty, as devised by Y K Alagh, in 1979 was further improvised by the Expert Group headed by DT Lakdawala in 1993. Later an Expert Group led by Suresh Tendulkar in



2009 devised methodologies to measure the number of poor in India. These improvisations led to more reliance on the National Sample Survey Organisation's (NSSO) methodologies on consumption expenditure by households. This was considered to be a much better method to adjust for inter-state and inter-region parities in price changes over time and the use of the better recall period introduced in the NSSO's survey

The C Rangarajan report (2014) was released two months before the Planning Commission was closed down and later transformed into NITI Aayog. The report states that,

“The Planning Commission methodology for estimating poverty at national and state level was regarded by some as inappropriate in giving a representative picture of the incidence of poverty in the country. The main points of the criticism were (a) the adjustment procedure; (b) the choice of deflators to represent price changes in the poverty line; (c) application of the same poverty line in all the states, which imply the absence of price differentials across the states; (d) use of a fixed consumption basket over time; and (e) the uniform consumption basket for all the states.”

Tables below show poverty estimates by Lakdawala and Tendulkar Methodologies. It was the Tendulkar methodology that made the poverty line even across rural and urban areas and the states of India and the only adjustment required is the cost of living to account for differences in prices. In terms of monetary value, it expresses the monetary value of the normative expenditures necessary for satisfying basic needs (Himanshu 2010)

**. Table 3.6 Expert Group Lakdawala Method Poverty Ratio and Number of Poor**

Poverty Ratio and Number of Poor Expert Group (Lakdawala) Method						
Year	Poverty Ratio (%)			Number of Poor (million)		
	Rural	Urban	Total	Rural	Urban	Total
1973-74	56.4	49.0	54.9	261.3	60.0	321.3
1977-78	53.1	45.2	51.3	264.3	64.6	328.9
1983	45.7	40.8	44.5	252.0	70.9	322.9
1987-88	39.1	38.2	38.9	231.9	75.2	307.1
1993-94	37.3	32.4	36.0	244.0	76.3	320.3
2004-05 (URP)	28.3	25.7	27.5	220.9	80.8	301.7

N.B. URP = URP consumption = Uniform Recall Period consumption in which the consumer expenditure data for all the items are collected from 30-day recall period.

(Source Planning Commission Archive, 2014, Government of India)



**Table 3.7 Tendulkar Methodology Percentage and Number of Poor**

Percentage and Number of Poor Estimated from Expert Group (Tendulkar) Methodology						
Year	Poverty Ratio (%)			Number of Poor (million)		
	Rural	Urban	Total	Rural	Urban	Total
1993-94	50.1	31.8	45.3	328.6	74.5	403.7
2004-05	41.8	25.7	37.2	326.3	80.8	407.1
2009-10	33.8	20.9	29.8	278.2	76.5	354.7
11-12	25.7	13.7	21.9	216.7	53.1	269.8

Source Planning Commission Archive, 2014, Government of India

**Table 3.8 Decline in Poverty Ratio Estimated from Expert Group (Tendulkar) Methodology**

Decline in Poverty Ratio Estimated from Expert Group (Tendulkar) Methodology			
(%age points per year)			
Period	Rural	Urban	Total
1993-94 to 2004-05	0.75	0.55	0.74
2004-05 to 2011-12	2.32	1.69	2.18
1993-94 to 2011-12	1.36	1.01	1.30

Source Planning Commission Archive, 2014, Government of India

Planning Commission's varied methodologies and resultant estimates of number of poor in the country as we see from the data tables have been widely debated in the academic as well as policy circles. But apart from the methodological debates in estimation, the poor have been an important political narrative.

Challenges for the Indian government towards addressing inequality are a bit different than those in the west, or from the Asian giants. India's share in the global GDP is 3.15 per cent comparatively, US is 24 per cent, China 15 per cent. India's population is 17 per cent of the world. Indian corporations are not as huge (in terms of capital) as that in the US, EU or in other Asian countries- and these governments are not able to regulate corporate predation. Moreover, a majority of India's population still lives in villages and is engaged in agricultural activities. Though, that is slowly changing, industrial opportunities for the rural populations are still lesser in India.

#### **Socio-Economic and Caste Census and Rural Poverty**

The census of 2011 and the subsequent socio-economic and caste census (SECC) conducted household surveys to analyse poverty through household assets and income. About three-quarter of

rural households in India were found to have a monthly income of less than Rs 5,000 and about half of the households were dependant on manual labouring jobs to earn their livelihood. More than 70 million rural households were found to be facing exclusion, either from assets or socio-economic benefits, according to data released by the Socio-Economic Caste Census (SECC) survey in 2015. As many as 833 million people in India, or 69% of the population lived in rural areas according to censuses 2011 estimates. Socio-economic exclusion also implies exclusion from state protection. This data-set was released by the government of India at a time when global credit rating agencies, such as Moody's (in 2015), were indicating how slow growing rural economy was taking India's economic growth indicators down.

Another aspect of inequalities in India was highlighted by the state-wise indexing developed by the Raghuram Rajan Committee, whose report was released in 2013.

The multi-dimensional human development index defined proposed by the Raghuram Rajan Committee was calculated in terms of "(i) monthly per capita consumption expenditure, (ii) education, (iii) health, (iv) household amenities, (v) poverty rate, (vi) female literacy, (vii) per cent of scheduled castes-scheduled tribe population, (viii) urbanisation rate, (viii) financial inclusion, and (x) connectivity". This index replaces the earlier Gadgil-Mukherjee formula for allocation of welfare funds for the states of India which was criticised as discretionary and at times arbitrary by many quarters. " ... the Raghuram Rajan Committee effectively negates the "right to development", which requires a Rawlsian framework of "differential treatment" (or "special status") to realise both vertical and horizontal equity in a genuinely federal system" (Kumar 2013).

### **Aspirational Districts**

NITI Aayog indexed the districts of India on the basis of poverty, education, health and public infrastructure. A list of most backward districts was prepared to include regions from all the states of India. Officers from the central government have been appointed to look after each district and help stakeholders interact for smoother implementation of schemes.

To quote NITI Aayog's policy declaration, "Launched by the Prime Minister in January 2018, the 'Transformation of Aspirational Districts' programme aims to quickly and effectively transform these districts. The broad contours of the programme are Convergence (of Central & State Schemes), Collaboration (of Central, State level 'Prabhari' Officers & District Collectors), and Competition among districts driven by a mass Movement. With States as the main drivers, this program will focus on the strength of each district, identify low-hanging fruits for immediate improvement, measure progress, and rank districts.

The Government is committed to raising the living standards of its citizens and ensuring inclusive growth for all – "SabkaSaathSabkaVikas". To enable optimum utilization of their potential, this program focusses closely on improving people's ability to participate fully in the burgeoning economy. Health & Nutrition, Education, Agriculture & Water Resources, Financial Inclusion & Skill Development, and Basic Infrastructure are this programme's core areas of focus. After several rounds of consultations with various stakeholders, 49 key performance indicators have been chosen to measure progress of the districts. Districts are prodded and encouraged to first catch-up with the

best district within their state, and subsequently aspire to become one of the best in the country, by competing with, and learning from others in the spirit of competitive & cooperative federalism.

NITI Aayog in partnership with the Government of Andhra Pradesh has created a dashboard for monitoring the real-time progress of the districts. District Information Officers underwent training on how to enter data to the dashboard and generate MIS (Management Information System) reports. Districts will be ranked based on progress made ('delta ranking') on a real-time basis. The dashboard will be open to the public to monitor the progress of the aspirational districts."

#### **To Do Activity**

Create a map of NITI Aayog's Aspirational Districts. What are the advantages of collecting real-time development data from villages for policy-making?

### **3.4 Rural Economy**

#### **Contribution to GDP**

To understand the contribution of the rural economy to India's GDP, let us understand some definitions first-

GDP or Gross Domestic Product can be defined as the total value of everything produced in the country. It doesn't matter if it's produced by are citizens or foreigners. If they are located within the country's boundaries, their production is included in GDP.

GDP is a method of estimation of country's production.

The government of India, in 2015 decided to use another method- GVA or Gross Value Added.

Simply, GVA can be understood as-

$$\text{GDP at Market Prices} = \text{Sum of GVA at basic prices} + \text{product taxes} - \text{product subsidies.}$$

In this context, when GVA from all sectors are added together and necessary adjustment for taxes and subsidies are made, we will get the GDP for the economy.

In 2018, the government moved to the GDP method again. But to understand the economic production data from the period 2015 to 2018 from the government sources, we have to use GVA methodology.

As shown in the table below, agriculture and allied sectors had a 15.4% share in the country's GVA.

**Table 3.9 Gross Value Added (GVA) Major Sectors of India, 2015-16**

<b>Major Sectors of India Gross Value Added (GVA) 2015-16(Provisional Estimates)</b>			
<b>Industry</b>		<b>( In ₹ Crore,at constant prices)</b>	<b>Share in GVA (in per cent)</b>
1.	Agriculture, forestry and fishing	<b>16,04,044</b>	15.4
2.	Mining and quarrying	<b>3,18,377</b>	3.1
3.	Manufacturing	<b>18,21,926</b>	17.5
4.	Electricity, gas, water supply & other utility services	<b>2,31,228</b>	2.2
5.	Construction	<b>8,87,957</b>	8.5
6.	Trade, repair, hotels and restaurants	<b>19,98,292</b>	19.2
8.	Financial services	<b>22,48,845</b>	21.6
10.	Public administration and defence	<b>13,16,552</b>	12.6
12.	TOTAL GVA at basic prices	<b>1,04,27,191</b>	

Source Central Statistics Office

### **Shifting Occupations and Sectors**

Recall from Chapter 1, we had identified shifting occupations in rural India citing NITI Aayog study. To cite from the same paper, “Contrary to the common perception about predominance of agriculture in rural economy, about two third of rural income is now generated in non-agricultural activities. Similarly, it looks amazing to find that more than half of the value added in manufacturing sector in India is contributed by rural areas. However, the impressive growth of non-agricultural sector in rural India has not brought significant employment gains or reduction in disparity in worker productivity. This underlines the need for a new approach to direct the transition of rural economy.” (Chand, Srivastava and Singh, 2017).

This study has shown that the rural economy is not only dependent on agriculture sector anymore. It has shown the only one-fourth of industrial production came from rural factories in 1971 and this was estimated to have doubled by the year 2012. But what was surprising in this study was the fact that in the period 1971 to 2012, the share of industrial production from rural India doubled but employment of village population in industries did not increase at the same rate.

This leaves rural population still engaged in agricultural occupation and many pushed into marginal or part-time jobs. The biggest anti-poverty programme by the government of India- Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) also addresses the issue of underemployment for rural population by providing them work for at least 100 days in a year and fixing a minimum wage.

According to newspaper reports and government’s policy initiatives in 2018, the agriculture sector during the budgeting exercise by the central government were not found to be in very good shape.

The agriculture sector, it was found that, employed more than 50 per cent of the total workforce of India and in proportion it contributed around 17-18 per cent to the country's total GDP. Recall from Chapter 1, the number of people engaged as agricultural labourers in villages of India has been on an increase since 1951 as shown in the data table above from the Census surveys. The proportion of agricultural labourers has also increased from 19% in 1951 to 30% in 2011.

It was found that the sale of tractors had increased, indicating that the farmers were moving towards mechanization though, the sale of tractors is not the only measure of farm mechanization. The economic reports from the government said that the Indian tractor industries had emerged as the largest in the world. About one-third of total global tractor production, it was reported in 2018 economic survey, was from India. It was estimated that percentage of agricultural workers of the total work force would drop to 25.7 per cent by 2050 from 58.2 per cent in 2001. Hence, the government officials noted that there was a need to increase mechanization for farms if the population is moving from agriculture as an occupation. Because of being labour-intensive, the crop production costs are also too high and they need to be reduced as well to ensure more availability of cheaper food for India's poor.

### **Financing and Self-help Groups**

Another important factor about rural economy is related to credit and financing in the rural sector. Recall from Chapter 1, where we had discussed the structure and institutions of rural economy in India. In this Chapter we discuss credit and loaning in the rural economy.

In the first Chapter we had also discussed NABARD. Over the years, after its genesis in 1982, NABARD has achieved many goals in rural credit and micro-financing services. This has helped improve many of rural lives across the India. Most important achievement has been the Self Help Group- Bank Linkage Project launched by in 1992, which grew into the world's largest micro finance project. NABARD also takes pride in Kisan Credit Card, designed by the body which is one of the major sources of relief for the farmers. The bank has about financed one fifth of India's total rural infrastructure, according to its estimates in 2018. They are also pioneering in the field of watershed development as a tool for sustainable climate proofing.

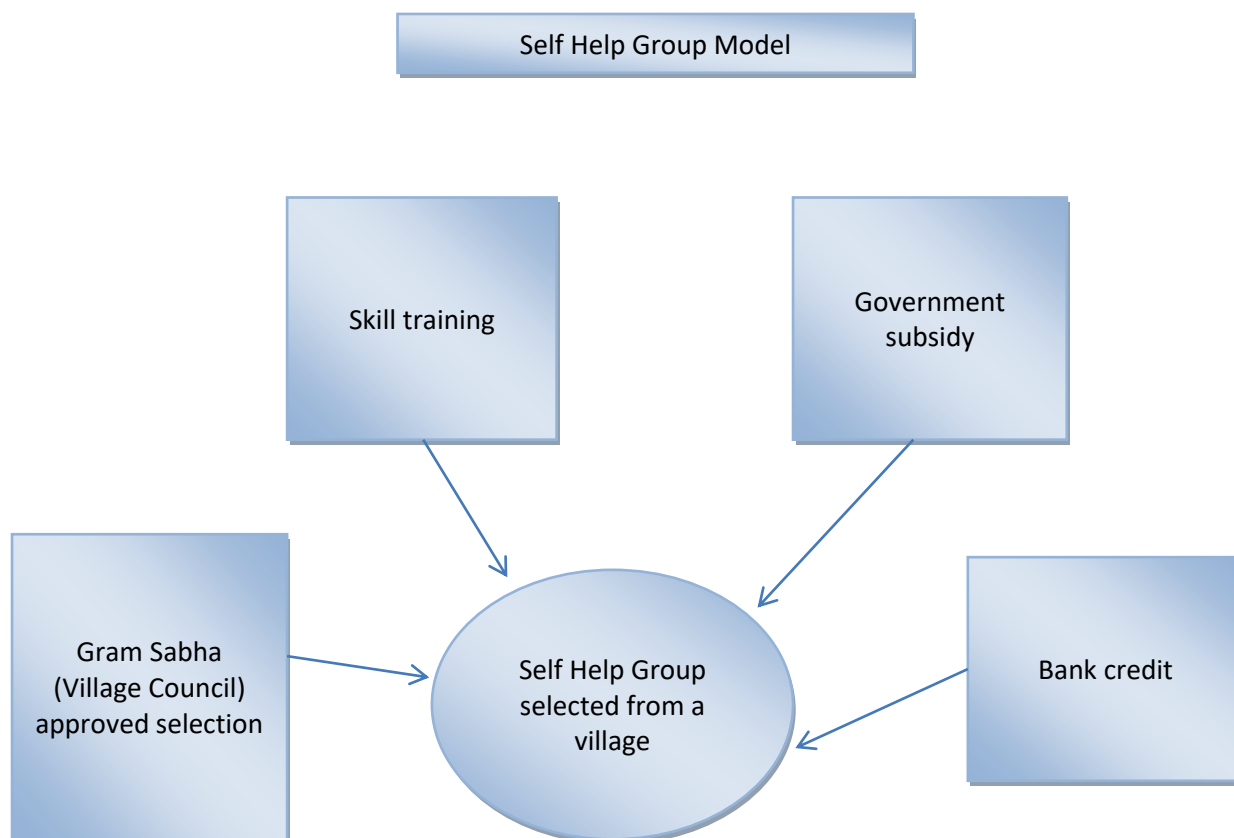
Major sources of rural credit in India according are-

- Co-Operatives and Credit Societies- These are the most popular and least expensive in terms of interest rates. These were introduced to curb the local, informal money lenders.
- Land Development Banks- formerly known as land mortgage banks, Land Development banks mainly provide long-term loans to farmers against the mortgage of their lands at low rates of interest over a period of 15 to 20 years. These banks cater to costly land improvement needs of farmers such as digging or deepening of wells.
- Commercial Banks- Before bank nationalisation in 1969, where top 14 commercial banks were nationalized, these banks only focussed on urban customers. Agriculture and rural industries were neglected by them since agriculture was a risky venture, private commercial banks turned away from rural areas. But after nationalization and efforts by NABARD later, commercial banks also invested in the rural sector. It was one of the objectives of

nationalisation of commercial banks to ensure a smooth flow of credit to agriculture and small-scale industries—the two top priority sectors of Indian economy.

- Regional Rural Banks- The Government set up a network of regional rural banks In 1975, to look into the special needs of small and marginal farmers, landless workers, rural artisans and the rural poor in general. The unique feature of these banks is that they cater exclusively to the weaker sections of the rural community through branches spread over India.
- The Government- The Government also provides short-term and long-term loans to farmers in times of emergency such as floods or famine. Such loans are offered at a concessional rate of interest and the mode of repayment is also very convenient. It can be repaid in several instalments at the time of payment of land tax. However, such loans have not assumed significance over the years.

Other than credit facilities, the government of India also from time to time gives loan wavers to farmers. This is done mostly to overcome the climatic risks. Though criticized as populist measures, loan wavers to farmers can be of great help in drought or flood years. Other than agricultural credit, the two flourishing sectors in rural India are the small and medium enterprises and cooperatives. Recall from Chapter 1, we studied structures of the Self Help Group (SHG) model of development for rural India has been popularised by NABARD. SHGs function at community level to foster rural development through skill training, government’s assistance, micro-finance and cooperation of the community members who are a part of the SHG. Below is a model of how an SHG is organised.



**Figure 3.1 Self-help Group Model**

Member of an SHG help and support each other both financially and for training to set up businesses

where needed. They are also collectively responsible towards loan repayments even of individual members. The local government committees at village level also help in formation of SHGs and monitor progress and resolve disputes. Skill training is carried out for members to set up local small-scale industries or handicrafts units. At times, the government subsidises training or credit for SHGs under various schemes. NABARD also provides knowhow other than micro-credit for the SHGs.

### **Risk Management and Insurance in Rural Credit**

The financial product which is missing in rural credit is risk management. According to Mahajan (2017), “For crop-insurance, the Prime Minister’s FasalBeemaYojana seems to incorporate all the lessons that were learned from the Indian as well as international experience in crop insurance. Some new technologies such as automated weather stations and global positioning systems have been incorporated into it. It has been simplified at the front end while at the back end, a complex claim determination process has been specified. There is also public private partnership in the sense that the insurance provided by a private insurance company which gets this right through a reverse bidding process for different regions. This is a state of the art design. We still have to see how the PMFBY runs for three to five years.”

#### **To Do Activity**

Study a self-help group in a nearby village and build a structural model.

## **3.5 Challenges and Opportunities**

### **India’s Changing Rural Demography**

Over the past decades, India’s villages have witnessed a shift towards urbanization. Migration and transition of villages into towns are responsible for this transition.

As we see in Prof Bhagat’s (2012,2017) papers, migration to urban areas implies economic development. In his studies, it was found the labourers who migrate from villages to cities in India often pick up two or more skills to keep themselves economically engaged. In NITI Aayog Studies (Chand, Srivastav, and Singh, 2017) we saw a transition in sectors in rural India. Manufacturing sector has risen in India’s villages over the past forty years and it has not employed as many people from the villages.

One of the reasons for this can be that the cohorts in rural India that are in the working age population of 15 to 59 years are still completely illiterate and unskilled. “India’s working-age population, as per the 2011 census data, comprised of 197 million illiterates. Out these, 160 million were in rural areas” (Tewari, 2017). Further, more than two decades after the liberalisation reforms that took place in 1992, one-fourth of India’s rural population lived below the statistical poverty according to the 2013 estimates by the Tendulkar methodology. In 1993-94, shortly after the liberalisation reforms, the proportion of population below the poverty line was 50 per cent in rural India and 45 per cent overall. Over 328 million people in rural India were estimated to be living below the poverty line (BPL) in the 1990s. They were dependent on the government’s welfare

schemes for access to basic amenities and public healthcare and education. Poverty played a major role in lack of skill development and poor quality of human capital in India. Accessing education and skills was difficult for these people and hence they could not have competed in the service job markets that emerged after the liberalisation reforms.

### Changing Sectoral Growth and Skill Demand in India Impact on Rural Population

Since 1950s, the share of agriculture in the total GDP has been steadily declining. And at the same time, the population of farmers and especially casual agricultural labourers has been increasing in rural India.

**Table 3.10 Per cent Share of Sectors in Total GDP (At Constant Prices)**

Share (in per cent) of Indian Sectors in Total GDP (At Constant Prices)					
Year	Agriculture and allied services	Industry	Mining and quarrying	Manufacturing	Services
1950-51	51.9	16.2	1.8	9	29.5
1960-61	47.7	20.1	2.2	11	30.2
1970-71	41.7	23.6	2.2	12.7	33.3
1980-81	35.7	25.7	2.6	14	37.7
1990-91	29.5	27.6	3.5	15.1	42.6
2000-01	22.3	27.3	3	15.5	50.5
2010-11	14.6	27.9	2.3	16.2	57.5
2013-14	13.9	26.1	1.9	14.9	59.9

Source NITI Aayog

This pushes rural population into underemployment and poverty. Obviously, when the services sector is growing, the demand for workers in the sector also is growing. Agriculture sector on the other hand is not just underdeveloped but also employs many unskilled manual labourers.

The government of India launched the Skill Development Mission in 2014. The current size of India's formally-skilled workforce is small at approximately 2%, the according to labour bureau reports. This number compares poorly with smaller countries like South Korea and Japan which report figures of 96% and 80%, respectively, according to international estimates quoted in Economic Survey of India, 2015.

Policy focus in India emphasises the importance of tapping the demographic dividend through Skill India mission. However, a focus on agriculture is missing in this policy. With nearly 42% of the rural workforce dependent on the sector, the only advantage under policies such as Make-In-India is in the form of food processing units. Moreover, India also has 62 agricultural universities under the Indian Council of Agricultural Research. But the sector lags behind on technology, growth and productivity as is clear from the table below with world comparisons.



**Table 3.11 India and the World Cereal Productivity and Agriculture's Share in GDP**

India and the World Cereal Productivity and Agriculture's Share in GDP				
Country	Industry as % of GDP (2013)	Agriculture as % of GDP, 2013	Cereals Total Yield, 2010 ('000 hectograms/hectare)	Cereals Total Production, 2010 ('000 tonnes)
China	43.9	10	55	497943
USA	21	1.3	70	401670
UK	20.2	0.7	70	20946
Brazil	25	5.7	40	75161
Japan	25.6	1.2	48	9234
Argentina	28.5	7	50	47146
India	30.7	18	27	267838
France	19.8	1.7	70	68285
South Africa	29.9	2.3	41	14699

Source FAO, World Bank

### Promoting Good Practices in Rural India Environmental Concerns

A recent paper from the United Nations Development Programme (UNDP) highlighted the environmental concerns related to rural development (Chopra et al, 2012). This policy report also identified rural development schemes of the government of India where specific interventions can lead to green development of India's villages.

The paper highlights the following schemes that have had the potential to make a significant contribution to sustaining natural resources and ecosystem services. To quote from the paper-

- A vast majority of the works under MGNREGS are linked to water, soil and land. The list of 'permissible' works provide environmental services such as conservation of water, groundwater recharge, reduced soil erosion, increased soil fertility, conservation of biodiversity, reclamation of degraded crop and grazing lands, enhanced leaf manure, fuel wood and non-wood forest products supply among others.
- The Integrated Watershed Development Programme (IWDP) aimed to restore ecological balance in a watershed by harnessing, conserving and developing degraded natural resources such as soil, water and vegetative cover and thereby help provide sustainable livelihoods to the local people. The scheme's potential for green outcomes is also enhanced if it supports the adoption of "green agronomy" practices and promotion of use patterns that sustain natural resources including groundwater and soil fertility
- Under National Rural Livelihoods Mission or NRLM the guidelines for non-timber forest produce-based livelihoods under the MahilaKisanSashaktikaranPariyojana (MKSP) identified regeneration and sustainable harvesting of NTFP species as key objectives; similarly, promotion of organic and low-chemical agriculture and increased soil health and fertility to sustain agriculture-based livelihoods is an objective under the sustainable agriculture component of MKSP; increased availability of green

inputs and advisory services to farmers and livestock herders and use of renewables-based energy services for processing activities have immense potential for green outcomes

- Under Indira AawasYojana (now PradhanMantriAwasYojna), green results include efficient use of resources, including water, energy and construction material. Further, IAY can encourage greater use of renewable and locally available construction material, and reduced use of water and energy.
- Nirmal Bharat Abhiyan (now Swachh Bharat Abhiyan) – formerly the Total Sanitation Campaign (TSC) - has recently expanded its scope from eradication of open defecation to comprehensive sanitation in rural areas. Ten percent of the project funds is earmarked for solid and liquid wastes management. NBA can ensure safe disposal of solid and liquid waste, and prevent untreated wastewater from re-entering the water system. These results can substantially improve the quality of water.
- The National Rural Drinking Water Program guidelines give high priority to water supply source sustainability and water quality. Further, the potential for green outcomes is enhanced by an emphasis on safe disposal of sludge after treatment of contaminated water, and the use of renewable energy for water pumping.

India's villages are developing and transitioning towards towns. In this scenario, good practices can be adopted towards a more sustainable and ecology friendly growth.

**To Do Activity** In your local area, identify the changes in rural demography and economy in the past decade. Plan and conduct a small survey to find out changes in people's change of occupation in the area.

### Summary

In this Chapter we studied the fundamentals of demography and technical terminology from the field. We also focused on the importance of demography in policy-making. Demographic transitions in rural India are both due to urbanization and migration from villages to cities.

Rural poverty and its eradication is a big challenge before the government of India right now. While villages are contributing more towards industrial sector now, employment opportunities for people from villages in the sectors are limited. Over the past decade, majority of rural population has been pushed into casual farm laboring jobs and has been reliant on schemes such as MGNREGS for economic welfare.

This Chapter focuses on the challenges and opportunities in the rural sector created by the shifts in demographics and the economy and points out good practices that can be applied in policy towards sustainable growth of India's villages.

### Model Questions

1. List five main uses of the study of demography for policymakers in the context of Indian Census

2. What are the main indicators of rural poverty in India across government statistics?
3. Does a shift in rural economy from agriculture to manufacturing imply a low availability of foodgrains for India?
4. What are the main steps the government can take to improve agricultural credit?
5. How can demographic transitions affect the environmental policies?

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# Chapter 4 Indian Agriculture

## Introduction

The nature of Indian economy has remained agrarian since independence. Agriculture has been the major source of livelihood for people in the country. Although the agricultural sector's contribution to GDP has come down from 51.81 per cent in 1950-51 to 14.39 per cent in 2018-19, the sector still employs more than 50 per cent of total workforce in the country. After independence, the agricultural output has recorded a steady growth and has also contributed in the growth of other sectors.

Indian agriculture has done remarkably well in terms of output growth despite frequent weather and price shocks. The production of food grains increased by more than five times and the production of milk by more than seven times. During this period, the population increased by a little more than three times. India has thus been able to produce food faster than its growth in population. The Green Revolution in wheat and rice in the late 1960s and early 1970s, the White Revolution in milk in the 1970s, and the Blue Revolution in fisheries have all contributed to that success, making Indian agriculture a net exporter. Expansion of agricultural land area, institution reform and implementation of major irrigation project played an important role in shaping the Indian agricultural during the pre and early green revolution periods. India is a leading producer of pulses, spices, plantation crops, jute, milk, livestock, poultry and fisheries. It also produces and exports rice, wheat, sugarcane, groundnut, vegetables, fruits and cotton. India's agricultural exports are booming at a time when many other leading producers are facing stagnation or decline in their exports. Meanwhile, public agencies have accumulated massive stocks of grain and the private sector's share of investments in agriculture has increased.

Although agriculture accounted for only 14.39 per cent of GDP at constant (2011-12) prices in 2018-19, its role in Indian economy is much more significant due to its share in total employment. As per the Economic Survey 2017-18, about 50 per cent of total workforce in the country is engaged in the agriculture sector.

## Objectives

- To highlight the importance of agriculture in India
- To characterize the key features of this sector
- To provide a profile of different phases of agricultural development
- To analyze the role of modernization and technology in agriculture
- To address the issues and concerns in the sector

## Structure

Indian Agriculture	
4.1	Role and Importance of Agriculture
4.2	Key features of Indian Agriculture
4.3	Phases in Agriculture Development in India
4.4	Modernization and technology in Agriculture
4.5	Issues and Concerns

## 4.1 Role and Importance of Agriculture

### 1. Contribution to National Income

From the very beginning, agriculture has been contributing a major portion to our national income. Though the share of agriculture has been declining gradually with the growth of other sectors, it still remain very high compared to the developed countries of the world. Figure below shows the percentage share of agriculture in the total GDP of the country. In 1950-51, agriculture and allied activities contributed 51.88 per cent (at 2004-05 prices) of the total GDP. It declined to 47.65 per cent in 1960-6, in , 41.66 per cent in 1970-71, 35.69 per cent in 1980-81, 29.53 per cent in 1990-91, 22.26 per cent in 2000-01 to 14.37 per cent in 2011-12; whereas in UK and USA agriculture contributes only about 3 per cent of their national income.

Figure showing percentage share of Agriculture in GDP from 1950-51 to 2012-13

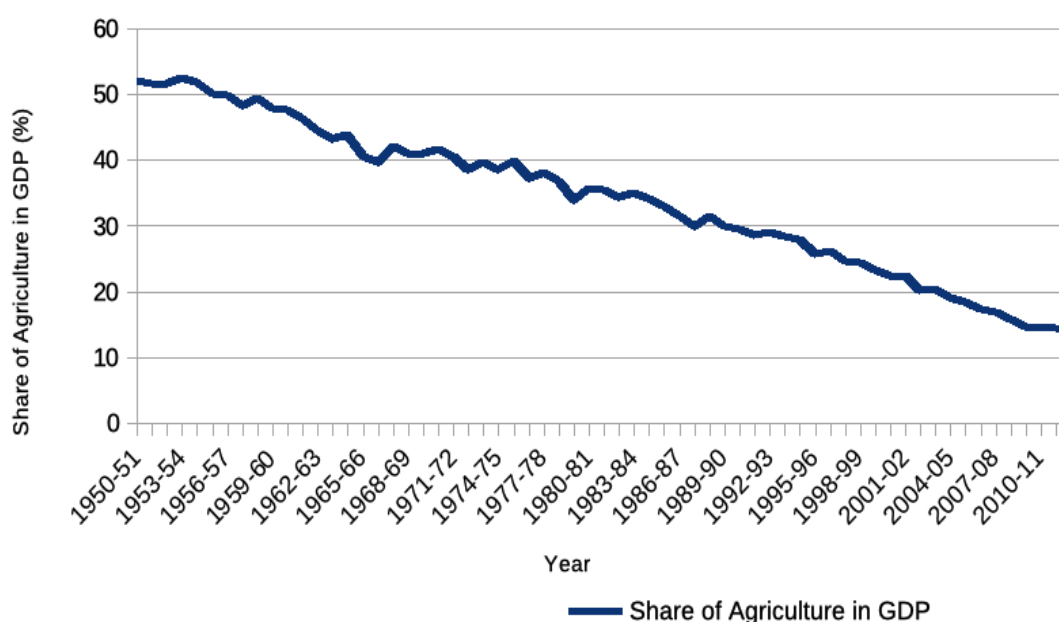


Figure 4.1 Percentage share of agriculture in India's GDP over years

### 2. Source of Livelihood

In India over half the total workforce is engaged directly on agriculture and allied activities and depends on the earnings from this sector for their livelihood. As per the World Bank, share of agricultural employment as percentage of total employment in India is 42.74 per cent. Whereas less than 2 per cent of the total workforce in U.K. and U.S.A. is engaged in this sector. Even developing countries like China and Brazil has the share of agricultural employment less than 18 per cent of the total employment. The employment pattern of India is very much common to under-developed countries of the world like Pakistan, Bhutan and countries from African Union.

### 3. Source of Food Supply and Role in the Public Distribution System (PDS)

Domestic agricultural production is the major source of food supply for such a huge population of our country. It has been estimated that about 60 per cent of household consumption is met by agricultural products. The agriculture sector is also closely linked to the Public Distribution System

(PDS) operated by the government for the dual purpose of procuring food grain from farmers (thereby protecting them against potential losses from price fluctuations in the markets of agricultural products) and ensuring availability of food grain at state level at affordable prices. In particular, the government manages the Public Distribution System for the following reasons

- a) To protect the low income groups by guaranteeing the supply of certain minimum quantities of food grains at affordable price;
- b) Ensuring equitable distribution; and
- c) Controlling the price rise of Essential Commodities in the open market.

Through this system, the government has attempted to ensure that both the farmers engaged in the agriculture sector as well consumers of agricultural products are protected against adverse price movements, and food availability is maintained across the country even in drought years. The surplus production in the agricultural sector is important to maintaining a buffer stock within the Public Distribution System.

#### **4. Role of Agriculture in Industrial Development**

Agriculture in India has been the major source of supply of raw materials to various important industries of our country. Cotton, silk and jute textiles, sugar, vanaspati, edible oil, plantation industries (viz. tea, coffee, rubber) and agro-based cottage industries regularly procure the raw materials directly from agriculture. About 50 per cent of income generated in the manufacturing sector comes from all these agro-based industries in India. Moreover, agriculture can provide a market for industrial products as an increase in the level of agricultural income may lead to expansion of market for industrial products. Thus agriculture has both demand side and supply side linkages with the industrial sector.

#### **5. Commercial Importance**

At the dawn of independence, the export basket of the country was mostly consisting of jute, tea and cotton textiles, which jointly contributed more than 50 per cent of the total exports earning of the country. In 1950-51, these three commodities contributed about 60 per cent of the total export earnings of the country. With the diversification and development of India's industrial sector, the percentage contribution of agriculture to India's total exports has gradually declined. However, agriculture continues to play a very important role in both the domestic and the international trade of the country. Agricultural products like tea, coffee, sugar, tobacco, spices, cashew-nuts etc. are the important items of our exports. Further, agriculture is helping the country in earning precious foreign exchange to meet the required import bill of the country.

#### **6. Source of Government Revenue**

Agriculture is one of the major sources of revenue to both the Central and the State Governments of the country. The Government gets a substantial income as land revenue. Some other sectors like railway, roadways are also deriving a good part of their business and income from the transportation of agricultural goods.

## 7. Role of Agriculture in Economic Planning

The prospect of economic planning in India depends a lot on agricultural sector. A good crop always provides impetus towards a planned economic development of the country by creating a better business climate for the transport system, manufacturing industries, internal trade etc. A good crop also brings a good amount of finance to the Government for meeting its planned expenditure. Similarly, a bad crop lead to a total depression in business of the country, which ultimately lead to a failure of economic planning. Thus the agricultural sector is playing a very important role in a country like India and the prosperity of the Indian economy still largely depends on agricultural sector. Thus from the foregoing analysis it is observed that agricultural development is the basic precondition of sectoral diversification and development of the economy.

### An increasing marketable surplus of agricultural output is very essential in India for

- (i) Increasing supply of food and raw materials at non-inflationary prices;
- (ii) Widening the domestic market for industrial products through higher purchasing capacities in the rural sector;
- (iii) Facilitating inter-sectoral transfers of capital needed for industrial development along-with infrastructural development;
- (iv) Increasing foreign exchange earnings through increasing volume of agricultural exports.

**To Do Activity** Find out the type of farming practised in your local area. Is this subsistence type or commercial type? Also, figure out types of crop which are grown.

## 4.2 Key Features of Indian Agriculture

Gross cropped area	195 million hectare
Net sown area	141 million hectare
Agricultural irrigated land (percentage of total agricultural land)	About 40 percent (as per World Bank data)
Animal husbandry output	About 30 percent of the country's agricultural output
Agricultural growth	4.1% in 2017, after increasing from 1.2% in 2015-16 (Economic Survey)

**Figure 4.2 Some facts about Indian agriculture**

Following are some of the broad features of the Indian agriculture

1. A significant proportion of the farmers in India practice subsistence farming, wherein the prime aim is to meet the food and other requirements of its vast population. Farmers select the crops with main objective of meeting their domestic needs rather than generating surplus for national and international markets. It is only recently that agriculture has become



commercialised and market oriented, a role gaining popularity amongst the farmers with large land holdings. The following table lists the difference between subsistence farming and commercial farming.

<b>Subsistence Farming</b>	<b>Commercial Farming</b>
This type of farming is practiced to meet the needs of the farmer's family.	Crops are grown and animals are reared for the purpose of selling in markets.
Traditionally, low levels of technology and household labour have been used to produce on small landholdings, generating small output.	The area cultivated and the amount of capital used is large. Most of the work is done by machines. Chemical fertilizers, pesticides, insecticides and high yielding variety of seeds are also used to get large output.
Subsistence farming may be primitive or intensive in nature.	Commercial farming includes commercial grain farming, mixed farming and plantation agriculture.

**Figure 4.3 Difference between subsistence farming and commercial farming**

2. Indian agriculture is facing the population pressure of the country. About 70 per cent of the country's population derives its livelihood from agriculture and allied occupations. Since India's population is growing at a faster rate of 1.13 per cent per annum, the per capita availability of agricultural land has declined over the years. This puts enormous pressure on agriculture.
3. Indian agriculture has the predominance of the cultivation of food grains which occupy 76% of the total cropped area and account for 80% of the total agricultural production of the country. These cereals include rice, wheat, millet, gram, maize and pulses which are grown to meet the food requirements of India's vast population (1027 million in 2001).
4. The agriculture shows diversity of crops. Sometimes four-five crops are grown simultaneously in the same field. This is done to ensure some agricultural production during unfavorable weather conditions. This mixed cropping reduces the agricultural output and per hectare yield.
5. India has the highest percentage (53%) of its geographical area under cultivation in comparison to many countries (USA 16.3%, China 11.8%, Japan 14.9%, Canada 4.3%, etc.) of the world. The climatic conditions especially temperature helps in providing a long growing season throughout the year. Due to pressure of population and consequent expansion in agricultural lands vast tracts of forests have been removed from the plains. In India, there is very little scope for increasing cropped area and in certain pockets even negative trend is being witnessed.

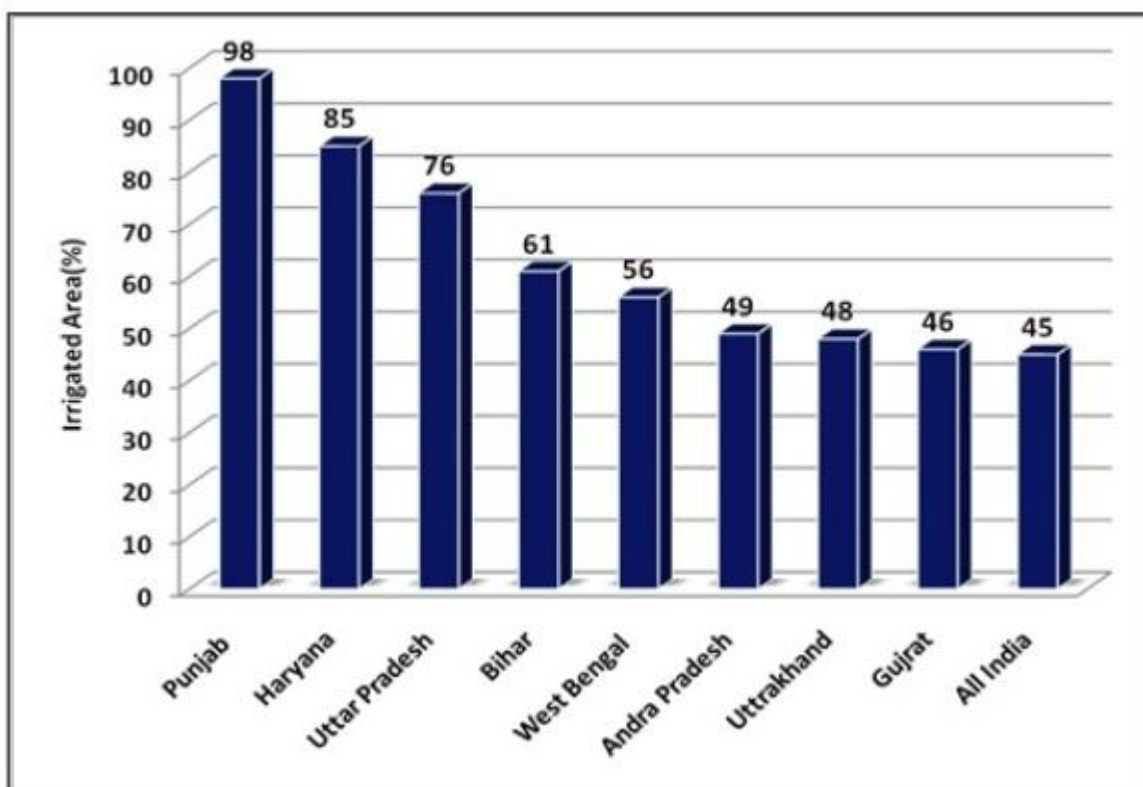
6. In India intensive farming is carried on in limited areas. Elsewhere, it is practiced on traditional lines (primitive subsistence farming). That is why per hectare yield of different crops is much lower than other countries of the world and India's total agricultural production is not very satisfactory and rewarding. Although with the application of chemical fertilisers and crop safety measures there has been marked increase in per hectare yield of different crops, it is still much lower compared to international standard. The following table shows the difference between intensive subsistence farming and primitive subsistence farming.

Primitive subsistence farming	Intensive subsistence farming
This type of farming is practiced on small pieces of land with the help of primitive tools like hoe, dao and digging sticks.	This type of farming is practiced with the help of modern tools and modern inputs.
Land productivity under this type of agriculture remains low	Land productivity is high due to use of modern tools and inputs.
Farmers depend heavily on monsoons and natural fertility of soil for yield.	Irrigation facilities like tube-wells and canal irrigation are used by farmers.

**Figure 4.4 Difference between primitive subsistence farming and intensive subsistence farming**

7. Indian agriculture utilises a number of draught animals like bullocks, horses, camels etc. in agricultural work. It is also labor based enterprise where all agricultural operations like tilling, sowing, weeding, sprinkling of insecticides/ pesticides, harvesting, threshing etc. are carried out by human hands. Although the use of agricultural machinery is replacing animal and human power, the pace of progress is very slow and confined to rich sections of the cultivators.

8. Indian agriculture is mostly dependent on rainfall whose variability in time and place has adverse effect on agricultural output. It is really a matter of concern that despite six decades of constant endeavor only 41.2% of the total cropped area has been brought under irrigation. Rest is dependent on rain water. That is why when rain fails agricultural production is badly affected, scarcity prevails and prices reach sky high. If the entire agricultural area is brought under irrigation agricultural production may be easily doubled. The following table depicts the percentage of irrigated area in some states in the country. Note that except for a few states, less than half of agricultural land in the country is under irrigation.



**Figure 4.5 State-wise percentage of irrigated land under agriculture**

Source State of Indian Agriculture, 2012-13 (published by Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India)

9. On an average, climatic factors in India are favourable for agriculture. That is why regions where enough moisture is available either through rainfall or irrigation, three to four crops can be cultivated in a year. But in the absence of adequate moisture even the cultivation of single crop becomes difficult.
10. Indian agriculture puts minimum attention on fodder crops (4% of cropped area). This together with lack of good pastures has detrimental effect over the development of dairy farming. India has the largest number of livestock in the world but doesn't do well when it comes to production of cattle products.
11. Indian agriculture has been the victim of negligence by the government. Much of the attention is focused on the development of industries and urban areas neglecting the vast countryside. The remunerative price for agricultural products, restoring tiller's right over land, and schemes of crop insurance are still cherished dreams difficult to be realised in near future.
12. Despite some breakthroughs, the basic structure of the agrarian economy still remains traditional in India. Established centuries ago, these structures of a self-contained rural economy, founded in caste-derived occupational land tenures made complex by absentee and parasitic landlords, have been slow to respond to modernization.

13. Indian agriculture suffers from numerous problems, i.e., small land holdings, unscientific method of farming, less irrigational facilities, less use of chemical, bio and natural fertilisers, greater vulnerability to pests and diseases, less remunerative prices for agricultural products, poverty amongst and lack of infrastructural facilities etc.
14. Indian agriculture also lacks a definite cultural land use policy at national and/or regional level and it is upto the farmer to grow crop of her/his choice. This sometimes leads to excess production and sometimes it leads to scarcity. Lack of marketing and storage facility and the activity of brokers and middlemen deprive farmers to fetch remunerative prices for agricultural products.
15. In India agriculture is not considered to an honorable profession. This leads to disempowerment and lack of enthusiasm amongst farmers. People prefer a petty government job to agricultural work. Rich farmers invest their agricultural profits in agricultural sectors which are more remunerative. There is mass exodus of people from rural to areas in search of lucrative jobs. There is constant flow of human and material resources from villages to the cities. This has led to growth of small urban centers and slums.

Thus many features of Indian agriculture are unfavourable for those depending on agriculture for their income and livelihood. Small and fragmented land holdings, lack of intensive farming, lack of a land use policy, etc. are challenges that have to be resolved with technological development and social and policy reform. This is one of the important concerns for the government today.

#### **4.3 Phases in Agricultural Development in India**

For better understanding of the performance of Indian agriculture, the post-independence period can be divided into five phases.

##### **1. Phase I – Pre-green revolution period (1950-51 to 1967-68)**

This was a technologically stagnant phase in which a larger farm production was possible mainly through increased application of all three traditional inputs viz. land, labour and capital. The rate of increase of output was normally lower than the rate of increase in inputs - revealing diminishing productivity of inputs, even at a low yield. Even though some elements of dynamic agriculture like application of fertiliser, improved seeds, and land reform were introduced, the increase in productivity was smaller. Further, given their resources and knowledge, the traditional farmers could not be more efficient as both these factors strongly limited their participation actively in contributing to higher production.

This period was characterized by a sharp decline in growth in agriculture, with the fall in decadal growth rates from 2.78 per cent to 1.06 per cent between the period 1950-51 and 1967-68. Majority of the country's policy makers used to think that the country cannot gain more growth rate in agriculture sector. Indian government was trying to push industrial growth during this period and hence lower allocation of resource towards agriculture during second and third plan. This turned out to be the major reasons for reporting lower growth rate in the mid-1960s, as compared to 1950s.

## **2. Phase II – Early green revolution period (1968-69 to 1985-86)**

The Indian agriculture entered the next phase after 1960s. The green revolution was kick-started from the year 1966 and the effects of adoption of superior technology and institutional reforms were found to have manifested from 1968-69 onwards. This is the beginning of the process of transformation from traditional agriculture to modern agriculture. In this phase, agriculture still represented a large portion of the total economy. But as population and incomes of people increased, it led to increase in the demand for agricultural products while the size of the average holding came down. There was also a scarcity of capital both in industry and agriculture. The farm sector still used more labour than capital, since labour, owned or hired, would be still, relatively cheaper than mechanisation.

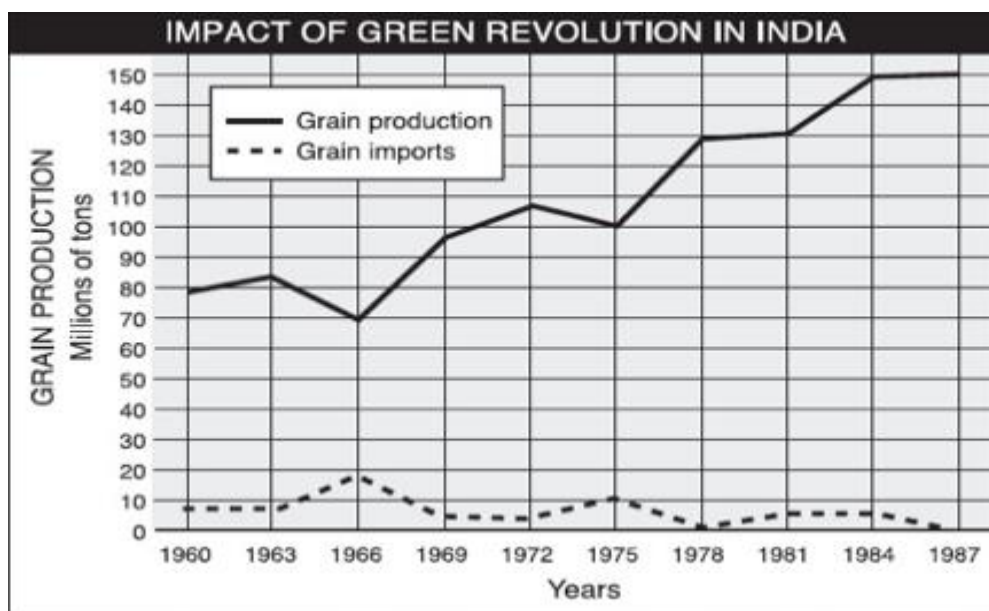
The distinguishing feature of this phase is the application of science and technology, evolved by research institutions, in a progressively large measure. This increased the productivity of farms when small capital additions were made in the form of improved seeds, fertilizers and pesticides. The profitable innovations were accepted by the farmers despite imperfections in land tenure, marketing and input supply system. The stagnancy that had marked the agricultural sector during the early-1960s, had largely been overcome around the end of the decade. In the wake of the new agricultural strategy of growth (called the Borlaug seed-fertiliser-technology) that had been adopted, agricultural production especially food grains, began to increase sharply.

Growth trend of Indian agriculture had been slow for many years. At the later stage of this phase, some change in the growth of agriculture GDP was observed. But, the benefit of green revolution was witnessed in the north Indian States, like Punjab, Haryana. Increase in agricultural production can be attributed either

- (i) To increase in area under cultivation (i.e. horizontal expansion), or
- (ii) To an improvement in yield per hectare (i.e. vertical expansion), or
- (iii) To both an increase in area under cultivation and an improvement in yield per hectare.

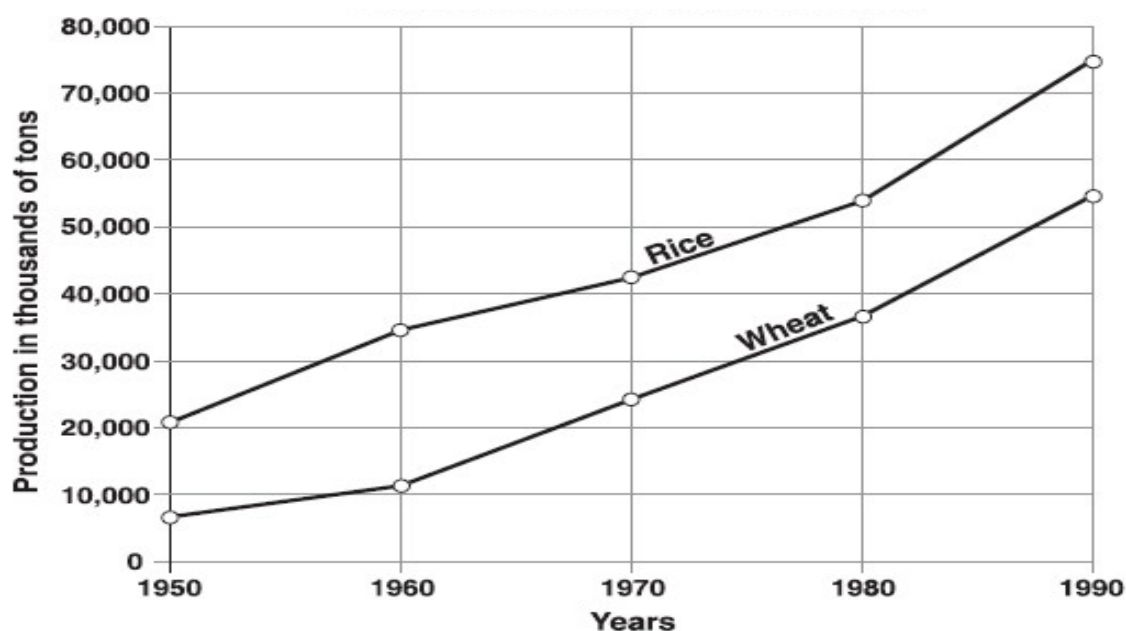
During this phase of transformation, significant contribution to improved agricultural output was achieved by way of improvement in agricultural productivity with little change in area under cultivation. Index number of area under cultivation changed marginally from 96.3 in 1970-71 to 105.2 in 1990-91. On the hand, the index number of agricultural production increased from 85.9 in 1970-71 to 148.4 in 1990-91 (Base 1981-82 = 100). This phase of agriculture transformation came to be known as the period of Green Revolution. The green revolution was, however, confined to a few crops- wheat and rice, and to few regions.

## Impact of the green revolution on food grain production in India



**Figure 4.6 Trends of foodgrain production in India**

Source James Killoran et al., *The Key to Understanding Global History*, Jarett Publishing Co. (adapted)



**Figure 4.7 Production of rice and wheat in India**

Source Library of Congress, Federal Research Division (adapted)

### 3. Phase III– Period of wider dissemination (1986-87 to 1996-97)

As previous phase advanced, more and more innovations giving small returns singly, but large returns jointly was adopted leading to higher productivity. In order to expedite progress, there was an extensive utilisation of available abundant factors. At the same time, relatively scarce infrastructural facilities like research, extension, marketing, etc. was being utilised optimally with efforts directed towards expanding the infrastructural resources.

Indian agriculture entered the third phase of technologically dynamic agriculture with high capital intensity towards the end of the decade of 1980s. This was precisely the period when the non-agricultural sectors also began their march towards modernisation. Non-agricultural sectors were facilitated in their move towards aggressive modernisation by the new policies of liberalisation, privatisation and globalisation. This phase of agricultural transformation is thus characterised by the substitution of labour by capital by way of large-scale farm machinery, and considerable competition between the sectors for capital.

The major aim of all the government programs was to transfer the benefit of green revolution from northern States to other parts of the country. This period can be classified as the phase of wider dissemination of technology for the benefit of the entire country. It was also witnessed that the decadal growth of agriculture reached around 3 per cent by the decade ending with 1985-86.

#### **4. Phase IV– Post-reform period (1997-98 to 2005-06)**

This phase was less productive phase in Indian agriculture. Majority of the Indian policy makers started giving higher importance to services sector. Therefore, tertiary sector found increasing trend and played dominant role in determining the overall growth of Indian economy during this period. This shift towards service sector has been attributed mainly to high marginal propensity to consume and technological advancements in areas such as software development, trade, communications and banking & insurance especially during the most recent period. The deceleration of growth started from 1997-98 onwards and a clear indication of slumping of the agricultural sector was visible till the year 2005-06. Expenditure on agriculture had experienced a major decline during this period. The declining government expenditure and rising share of revenue expenditure were the major reason for the lower agricultural growth rate during this period.

#### **5. Phase V– Period of recovery (2006-07 to present)**

A significant recovery of Indian agriculture was observed in the last few years that have pushed the decadal growth rate above 3 per cent. After decades of underinvestment in the agriculture, especially by the public sector, the declining trends in agricultural spending have recently begun to reverse, particularly after 2006-07. Total Agricultural Production has increased significantly each year post 2010. The promotion of Public Private Partnership (PPP) projects to support agriculture could be another reason for reporting higher growth rate during this period.

#### **Phases of agricultural development Conclusion**

From the facts and figures depicted above, it is found that green revolution period has been the golden period for Indian agriculture that witnessed tremendous growth in agricultural output as well as input. The period of wide dissemination of technology can be considered as most successful period in the history of Indian agriculture in which green revolution technologies have shifted from north to south and other remaining part of India. Therefore, we consider shift in policy making as a major driver of Indian agriculture sector mainly during green revolution and wide dissemination period. The post-reforms period witnessed a visible deceleration of growth in most of the major crops and this can be attributed to a significant diversion of resources away from agriculture to non-agriculture sectors. From the above discussion, it is further clear that government expenditure had a crucial role in influencing agriculture growth in the country. But private investment had a negative

impact on growth during post-reform period. Moreover, the use of primary inputs in the sector slowed down, and due to this, the yield of most of the crops went down. During this period, there was a shift in cropping pattern from food-grain to horticulture crops. Similarly, the export of horticulture crops was quite higher during this period. Therefore, we can argue that the rise in horticulture sector has become one of the important factors responsible for higher agriculture growth in the country. It is also found that the subsidy has played a crucial role for improving agricultural growth, especially during the post-reform period when public expenditure was low. There was a trade-off between subsidies and public investment in Indian agriculture. The public investment rate in Indian agriculture started recovering after 2005-06 year. It is revealed that the retardation of growth continued till 2005-06, and thereafter, a sharp recovery

The following table summarizes the five phases of development in Indian agriculture

<b>Phase</b>	<b>Features</b>	<b>Approximate duration</b>
Pre- green revolution	Sharp decline in growth of agriculture	1950 - 1960s
Early green revolution	Modernisation of agriculture with adoption of superior technology and institutional reforms	1960s- 1985
Wider dissemination	Transfer of benefit of green revolution from northern States to other parts of the country, with wider dissemination of technology for the benefit of the entire country.	1986 - 1997
Post reform period	Decline in government focus and expenditure on agriculture sector, with a shift towards focus on the tertiary services sector. This period was marked with deceleration of growth in agriculture.	1998 - 2006
Recovery	Increase in total agricultural production and growth rate in agriculture.	2007 onwards



#### 4.4 Modernization and Technology in Agriculture



Image Source kullabs.com

The importance of modernization and adoption of improved production technologies in the agricultural sector has been well understood for a long time. As already discussed, the policy initiatives that led to the Green Revolution were motivated by the need for improved agricultural productivity, and it was understood that this increase in productivity could only be achieved by technological advancements at both the biochemical and the mechanical level. While biochemical innovations involved the use of hybrid seeds, improved fertilisers, herbicides and pesticides, mechanical innovations involved irrigation to be powered by diesel and electric pump systems, mechanisation in other agricultural activities and improvements in the transport system.

Immediately after the green revolution, food grain production saw a substantial growth and there was a decline in the import of foodgrain. The production of rice and wheat crops enjoyed a particularly significant growth. However, after the initial growth post Green Revolution, technological advancement and modernization in India's agricultural sector began stagnating again. This was caused mainly by the farmers' struggles with issues of inadequate farm equipment, lack of access to fairly priced credit and distribution challenges due to intermediaries. In today's scenario, modernization is required in four main areas production, finance, infrastructure/storage and distribution.

##### 1. Production

Technological advancement in the form of better equipment, seed quality, pest-control and disease mitigation technology can directly increase agricultural productivity. Here it is important to remember that large machinery used in developed countries have very little applicability in most of our small farms. The key is to build mechanised processes suitable for small farms, that reduces dependency on manual effort and results in better productivity. Further, technology can also be used to carefully analyse changing demand, pricing and

fluctuations in weather conditions so as to allow farmers to make better choices about which crops to produce in any season.

## **2. Infrastructure/Storage**

Infrastructure constitutes several types of agricultural implements including machinery, cold storage facilities, suitable supply of power, proper road network and effective transportation systems. All of these are essential for agricultural produce to be stored and transported effectively. Currently India has a gap of 3.28 million metric tons of cold-storage amenities for fruits and vegetables. The accessibility of cold storage units and their apt use can maximize profits of the farmers and contribute to growth of the agriculture sector. In this regard, there is a need for investment in developing infrastructure and storage facilities, along with raising awareness about facilities that do exist.

## **3. Distribution**

There are many ways in which technology can potentially improve the distribution of agricultural output in the country. E-markets (online platforms connecting buyers and farmers) can drastically reduce the number of 'middlemen' or intermediaries in the agricultural supply chain, allowing farmers to make better incomes and profits. Already farmers in the country have begun to rely on technological solutions like online communication and information channels to access and share information about inputs, production technology and markets. For instance, a Facebook group for organic farmers in India with a member strength of 22,000 has become an engaging platform for farmers to seek help or advice from other farmers. Whatsapp groups are now used extensively by farmers to exchange knowledge and collaborate with peers. From ordering seeds online to seeking inputs on social media, there is rapid adoption of information technology by Indian farmers. Thus there is every reason to believe that innovative methods of improving distribution - with well designed awareness campaigns - will eventually be adopted by Indian farmers.

## **4. Finance**

Modernization of finance for the agricultural sector involves providing farmers with easily accessible farm credit and crop insurance. Technology can be particularly useful in ensuring that financial services reach even the remotest villages of the country and all farmers engaged in the agricultural sector can be easily included in the banking system. Here, the most important role of technology would be to make banking easy to access for farmers all over the country.

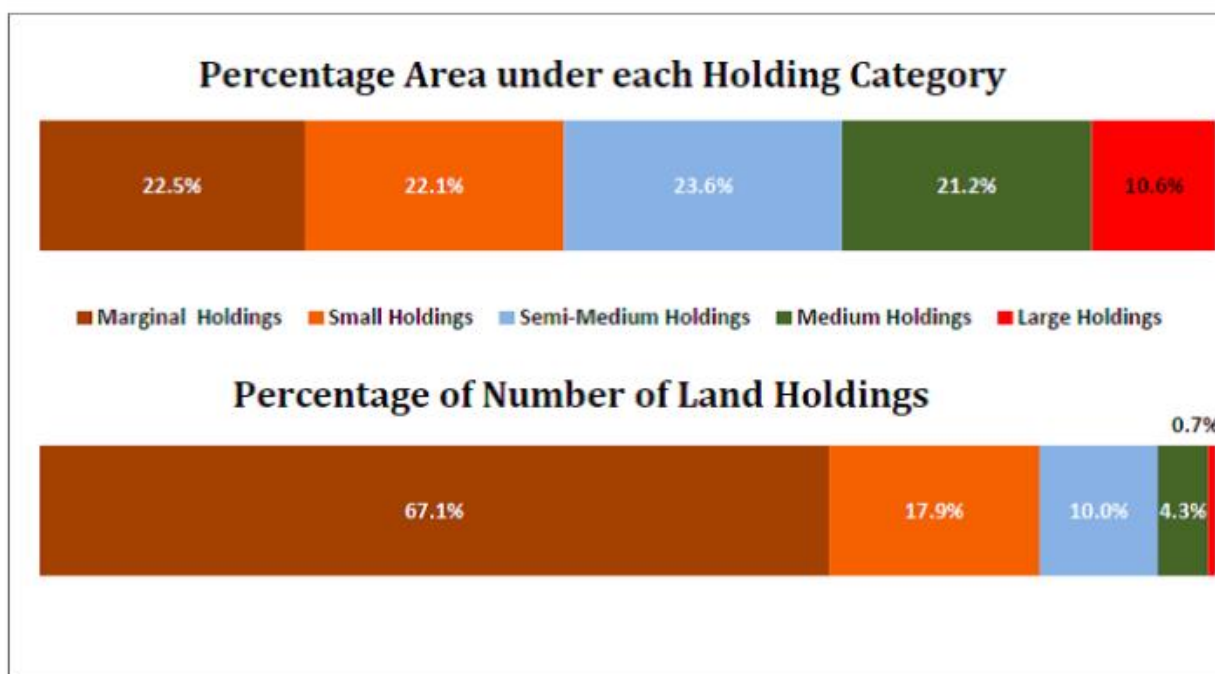
Finally, all modernization and technological advancement in agriculture needs to be supported by resolving the infrastructural issues of electric power supply and internet connectivity, which is becoming essential to access services like online banking, e-markets, etc.

### **4.5 Issues and Concerns in Indian Agriculture**

Despite continuous improvements since independence, the agricultural sector in India still faces a lot of challenges. Some of the main issues are

## 1. The issue of land

About 60 per cent of the total land area in India is classified as agricultural land. But there has been gross underutilisation of the available agricultural land. There are many reasons for it. Some farmers leave their land fallow for some seasons. Even though small farmers tend to utilise their land more fully but there have been evidences of greater under-utilisation of agricultural holdings by socially disadvantaged groups. Other than poor land quality, lack of proper irrigation facilities, problem of credit etc., a major challenge faced by the agricultural sector is the fragmentation of land holdings and massive inequality in distribution of land between small and large farmers.



**Figure 4.8 Distribution of land holding in India**

Source Agricultural Census of 2010-11

Category	Operated Area
Marginal Holdings	Below 1 Hectare
Small Holdings	1 to 2 Hectares
Semi-medium Holdings	2 to 4 Hectares
Medium Holdings	4 to 10 Hectares
Large Holdings	10 Hectares and above

**Figure 4.9 Categories of land holdings in India**

There have been inequalities in the access of land which has seriously affected the production base of farmers with small and marginal land holdings. Data show that benefits of land redistribution has trickled down only up to the middle level of peasantry as land base of marginal landowners has not improved over time. According to the Agricultural Census of 2010-11, the average size of land holding has been continuously decreasing on account of increasing number of land holdings. From an average of 1.41 hectares in 1995-96, it went down to 1.15 hectares in 2010-11, a decrease of 18%. While the number of Medium & Large holdings account for less than 5%, they make up for close to 1/3rd of the total area under operation. Though the number of Marginal & Small holdings account

for 85% of the total number of holdings, they together account for only 45% of the total area under operation. This has proved to be a major handicap in improving the livelihood of the vast number of tiny farmers.

Land available for agricultural purposes is declining as rapid urbanisation has led to conversion of land to non- agricultural purposes. Degradation of agricultural land has already become a serious concern in several parts of rural India. Land degradation is a localised problem and depends not only on the agro-climatic and socio-economic conditions of the region but also on the farmer's access to productive assets. Most of this degradation has been caused by human action. But the perception that degradation is caused by human actions attributable largely to the poverty of the farmers may only be partially true. Strategies of poor farmers for a sustained livelihood flow are not profit maximising strategies which are adopted by the rich farmers. Since the sustenance of land-poor depends on the sustained productivity of their meagre land resource, they cannot perhaps afford to allow the quality of their land to deteriorate. On the contrary, the land rich usually go for short-term gains from the produce of the land and can afford to absorb and overlook some degree of deterioration in quality

## **2. Irrigation System**

The growth of irrigation potential since independence has been substantial, yet the utilisation has remained a concern. Moreover, over the years, the structure of irrigation system has increasingly shifted towards ground water irrigation. This is partly because of the farmers' control over the system and more because of the lack of access to the surface water irrigation. Another factor could be the price-subsidisation of electricity for operating the tube wells or the diesel prices for gensets and pump sets.

Resulting decline in the water table has serious consequences on the small and marginal farmers whose access to groundwater is becoming increasingly costly. Reduced investment in canal irrigation, higher recurring costs of existing medium and major irrigation projects have further given a set back to the use of surface water. The system requires a review for the sustained growth of agriculture which is critically dependent on water-resources.

## **3. Availability and Access to Credit**

Some of the major issues concerning the availability and access to credit has continued to persist despite remarkable changes in the institutional support for the supply of credit to agriculture. These issues need to be examined and some of the policies governing the credit support system need to be critically reviewed.

About 60 per cent of the credit requirement of the farmers are met by institutional sources and the remaining 40 per cent by informal sources. The total amount of credit is highly inadequate for the growth of agriculture. Small and marginal farmers, including tenants who account for nearly 80 per cent of holdings and one-third of area operated, depend far more heavily on informal sources. The role of the moneylender has not been eliminated and given the fact that the relative share of commercial bank credit is on the decline, the role of the moneylender is likely to increase.

## **4. Other inputs**

The availability and use of inputs like fertilisers, seeds and pesticides have grown over the years. In the process, a number of issues like the balanced use of fertiliser, fertiliser price & subsidy and management of the subsidy have arisen. The gap between the production and requirement of improved quality certified seeds and the indiscriminate use of pesticides persist. It is desirable to improve the rates of production and productivity but there is an equally important need to disseminate knowledge among farmers. An organisational set-up which operates at the village level or closer to Chapter of villages with the Surveillance of Panchayats would perhaps be more effective.

### **5. Prices, Costs and Profitability**

The economic issues of income generation in agriculture depends on the prices received by the farm sector, prices paid (costs) and the profitability. Analysis of the prices and costs show that the MSP is more likely to have introduced distortion in the agricultural sector of the country particularly in respect of wheat and rice crops. It has also been inimical to the efficient allocation of resources within the agricultural sector. The system of minimum support prices has been able to keep the incomes of the farmers with large marketable surplus high but has been responsible for a fiscal strain and increasing funds being Chaptered in food storage more than required for reasonable food security and reasonable level of price stability.

### **6. Investment in Agriculture**

Long-term development of the agricultural sector demands a fair share of investment flowing to agriculture in particular and the rural sector in general. Availability of fixed capital, strong and vibrant agricultural infrastructures are vital requirements of the agricultural sector. The relative share of agricultural sector in the total Gross Capital Formation in the economy has declined both in the public as well as private sector. The major concern is that even though the relative share of agriculture in the GDP has been steadily declining, the relative decline in the investment in the sector has been far steeper. In an economy where opportunities for employment outside the agriculture sector are not growing at all or are growing at rates far below the rate of growth of labour force, the consequences of the decline in investment in agriculture can be serious. Moreover, with growing pressures for 'globalisation' i.e. opening up of the economy, the need for diversified agricultural sector is obvious. Diversification calls for more and not less investment. Policy-makers need to review their investment allocation policy soon enough; otherwise backlogs of investment will create further complications.

### **7. WTO Agreements on Agriculture**

Studies have shown that WTO-AOA has not benefited India in terms of agricultural exports. India could have joined in terms of increased agricultural exports if the domestic support and export subsidies were substantially reduced in the developed countries and market access enhanced through reducing quota tariffs. After the removal of quantitative restrictions, the main problem for India is from the heavily subsidised agricultural exports of the developed industrial countries. There is a considerable amount of evidence that export prices of some of the agricultural products are far below their costs of production. This can persist only through veiled or open subsidisation of exports. The WTO can, therefore, hardly make a massive change in the flow of trade on a free-market basis. This is only a wish which can hardly be fulfilled in a world where trade is going on among unequal's. Industrialised countries like USA, EU etc. can go to any extent to protect their economic gains and institutions. In the unipolar world, they seem to have the muscle strength also

for achieving their goals.

The list of issues and concerns mentioned above is by no means exhaustive; there are several other issues and concerns governing agriculture. It is not even an ordered set of issues; they are not presented here in the order of their importance. It is interesting to note that while corporate management is becoming increasingly systematised and is scaling new and newer heights, the issues governing the management of agriculture have continued to persist. Political tug of war over the solutions raises din and dust which shrouds these issues and their solution.

### **Summary**

This Chapter identifies the importance of agriculture in the Indian economy and society. Agriculture has a significant share in the country's GDP and engages more than half of the population for the purpose of employment and livelihood. Agriculture is also important to India's industrial development, foreign exchange earnings through exports and government revenue. Through several phases of development, India's agriculture has increased its growth and productivity by adopting modern inputs and techniques of production. However, many farmers engaged in the agricultural sector continue to be plagued by problems arising out of dependency on weather conditions (lack of irrigation), small and fragmented land holdings, and lack of financial credit etc. A strong policy effort is required to bring the agricultural sector out of these troubles.

### **Model Questions**

1. Give three reasons why agriculture is important to India's economy.
2. What are the main ways in which the agricultural sector supports growth in the industrial sector?
3. What is the difference between subsistence farming and commercial farming?
4. Identify five phases of development in Indian agriculture.
5. Identify four areas in which modernization and technological advancement can benefit the agricultural sector of India.

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# Chapter 5 Land Tenure Systems and Land Reforms in India

## Introduction

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. Land tenure is an institution, i.e., rules invented by societies to regulate behaviour. Rules of tenure define how property rights to land are to be allocated within societies. They define how access is granted to rights to use, control, and transfer land, as well as associated responsibilities and restraints.

Land tenure is an important part of social, political and economic structures. It is multi-dimensional, bringing into play social, technical, economic, institutional, legal and political aspects that are often ignored but must be taken into account. Land tenure relationships may be well-defined and enforceable in a formal court of law or through customary structures in a community.

Land is precious for any country and used by people for productivity and as a source of food, for place to live, for wood, for place to work. In India, before colonial rule the land used to be in the hands of the community as a whole. However, during the British Raj, this was changed which made it necessary to introduce reforms in land sector.

Land Reforms usually refer to redistribution of land from rich to poor. Land reforms include

- Regulation of Ownership
- Operation, Leasing, Sale
- Inheritance of Land

In an agrarian economy like India with massive inequalities of wealth and income, great scarcity and an unequal distribution of land, coupled with a large mass of people living below the poverty line, there are strong economic and political arguments for land reforms.

Due to all these compelling reasons, Land reforms had received top priority by the governments at the time of independence. The Constitution of India left the adoption and implementation of the land reforms to the state governments. This has led to a lot of variations in the implementation of land reforms across states.

## Objectives

- the major land tenure systems
- the concept of agrarian structure and land tenure
- the important features of agrarian structure before colonial rule
- the nature of land tenure systems and agrarian structure during colonial rule and Independent India
- the concept of land reforms, its objectives and implementation



## Structure

Land Tenure Systems and Land Reforms	
5.1	Origin and Development of Land Tenure Systems in India
5.2	Land Tenure Systems, and Agrarian Structure-Part 1
5.3	Land Tenure Systems, and Agrarian Structure-Part 2
5.4	Land Reforms in Independent India
5.5	Implementation of Land reforms Experiences, and Prospects

### 5.1 Origin and Development of Land Tenure Systems in India

Scholarly opinions are divided with regard to the question of land ownership in ancient India. Some holds the view that land ownership in India primarily belong to the state while others believe that the private ownership was the tenurial mode in ancient India. Ancient texts refer to private ownership of land, though at the same time some texts are found which affirm the existence of state owned land. Private ownerships were not absolute, natural or universal in early India.

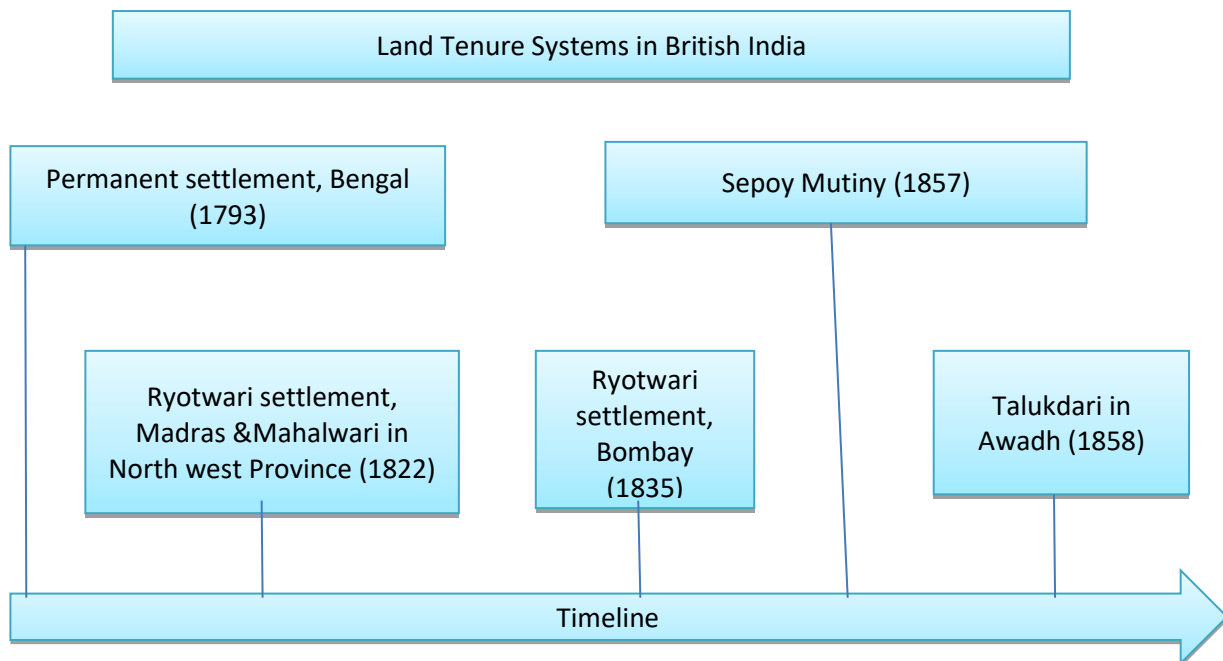
During the Vedic Age, land was considered to be the property of the community as well as the individual. Vedic rules prescribe vigilance in the proper upkeep and maintenance of land. Whether the land was owned by the community or the ruler or the individual, the main concern was the judicious distribution of the land among the people.

During the post-Vedic period, the king generally had no right over the land except the right to a share of the produce. The cultivators were regarded as the actual owners of the land. Sher ShahSuri started a proper land revenue system, which was later completed by Akbar. The Zamindars established their suzerainty during the Mughal period.

Under the British, the land tenure system was overruled for the benefit of the ruler. The zamindars were given the right of proprietorship over their property. The result was that the zamindars became the landlords and the cultivators were reduced to the position of mere tenants. They believed that the traditional control over the land belonged to the jemmies. They followed this idea for getting the support of the jemmies for their colonial rule and to create a favourable social background for their imperial expansion.

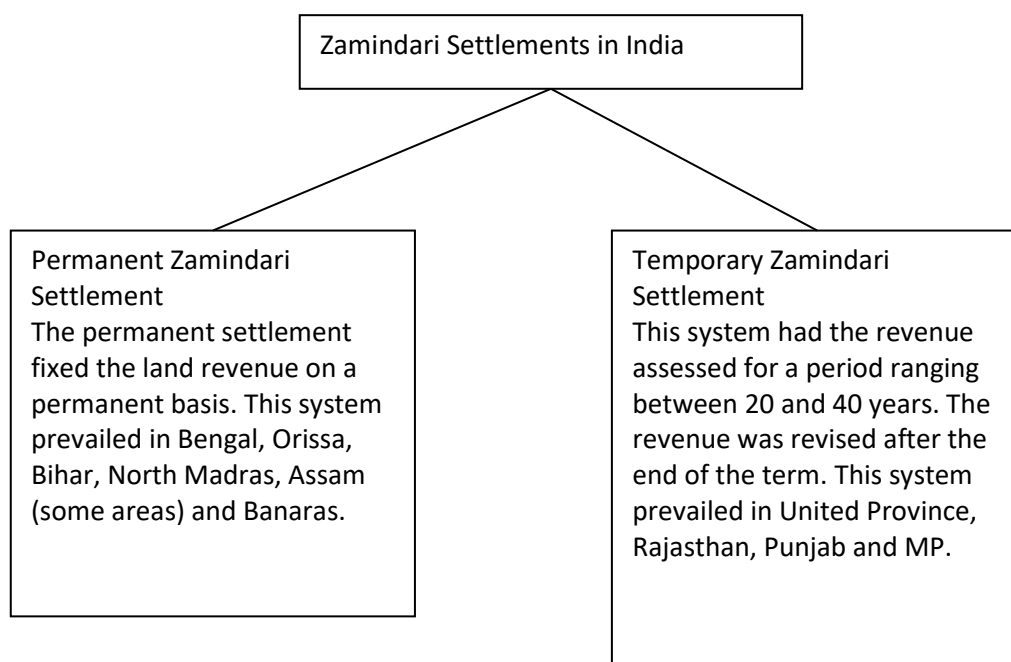
There were three main types of land tenures in India

1. Landlord tenure or Zamindari System
2. Independent single tenure or Ryotwari System
3. Joint village or village community or Mahalwari System



**Figure 5.1 Land Tenure Systems in British India**

**Under the Zamindari System**, the land was held by a person who was solely responsible for the payment of land revenue. Actual cultivation was done by the tenants while the land remained under the control of absentee landlords. The landlord simply was the provider of land and the tenants provided all the management and labour. This system was greatly responsible for exploitation of peasants, their oppression and poverty and above all low productivity. It was uneconomic and inefficient in respect of land use. The major defect of the Zamindari system was that, it led to breed inefficiencies and inequalities. The landlord was responsible for the payment of land revenue to the state and the actual tiller was not in direct contact with the state.



**Figure 5.2 Types of Zamindari Settlements**

The British Government pleaded that the Zamindars represented the most enlightened section of the rural population. But the Zamindari system as it worked in India suffered from a number of defects.

(a) Hindrance to Agricultural Development The Zamindari system worked as a formidable obstacle in bringing about economic transformation in rural India. The Zamindars evinced no interest in the improvement of either land or cultivation. Collection of revenue was their sole interest.

(b) Problem of “Absentee-landlordism” The Zamindari system supposedly introduced to promote progressive agriculture, degenerated into absentee landlordism. Absentee landlordism signifies conferment of a right of the sharing of the produce of the land on a few without participating personally in the productive process. The very creation of the section of absentee landlords resulted in the decay of the agriculture.

RuddarDatt and K. P. M. Sundharam have succinctly observed, “Historically, the landlords as a class are known for their extravagance on women, wine and vices. The landlords of India were no exception. Thus the money extracted from the cultivators by these parasites did not result in capital formation but increased conspicuous consumption.”

(c) Exploitation The Zamindari system itself was based on exploitation as it conferred unlimited rights on the Zamindars to extract as much rent as they wished. Approximately, one-fourth of the produce was taken away by the intermediaries in the form of rent.

(d) Psychological insecurity Under the Zamindari system the actual tiller of the land was not the owner of the land. Hence he was always in fear of his ejection from the land.

Under the Ryotwari System, there was the direct relationship between the state and the tenant (ryot), but when it fully developed, ryots began to sublet their lands. It was prevalent in most of southern India, being the standard system of the Madras Presidency (a British-controlled area now constituting much of present-day Tamil Nadu and portions of neighboring states). The system was devised by Capt. Alexander Read and Thomas (later Sir Thomas) Munro at the end of the 18th century and introduced by the latter when he was governor (1820–27) of Madras (now Chennai). The principle was the direct collection of the land revenue from each individual cultivator by government agents. For this purpose, all holdings were measured and assessed according to crop potential and actual cultivation. The advantages of this system were the elimination of middlemen, who often oppressed villagers, and an assessment of the tax on land actually cultivated and not merely occupied. Offsetting these advantages was the cost of detailed measurement and of individual collection. This system also gave much power to subordinate revenue officials, whose activities were inadequately supervised.

The name of the system comes from the word ryot, an Anglicization by the British in India of the Arabic word ra'iyah, meaning a peasant or cultivator. The Arabic word passed into Persian (ra'eyyat) and was carried by the Mughals, who used it throughout India in their revenue administration. The British borrowed the word from them and continued to use it for revenue purposes in the Anglicized

form. The word has passed into various Indian languages, but in northern India the Hindi term kisan is generally used.

The major advantage of this system was that there was no sub-infeudation and the cultivator had direct relation with the government. The peasant was free to look after his land properly and introduce, if necessary, all possible improvement on it and the magic of property ownership could turn “sand into gold”. This system created an atmosphere of frequent sub-letting of land. The defective method of assessment of land revenue under this system led to the decline of the collective basis of village life which led to the decay of village community.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• The system was successful in abolishing intermediaries.</li> <li>• The proprietor of the land evinced keen interest in improving the land and other associated facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• The ryotwari system through sub-letting encouraged the practice of absentee landlords.</li> <li>• Through the provision of mortgaging, the system has given rise to a new zamindar class with all its exploitative practices.</li> <li>• The method of assessment of land revenue, undertaken periodically by settlement officers, was arbitrary. As a result the ryot with small holdings suffered heavily in periods of irregular monsoons, droughts.</li> </ul>

The Regulation IX of 1833, which was passed during the period of Lord William Bentick, was the basis of Mahalwari System. This had elements of both the Zamindari and the Ryotwari systems. This system divided the land into Mahals. Sometimes, a Mahal was constituted by one or more villages. Tax was assessed on the Mahal and revenue was collected from the village. The individual cultivators were generally responsible for a certain share of the revenue but in the last resort, all the villages were responsible jointly and severally. Here also, ownership rights were with the peasants. Revenue was collected by the village headman or village leaders (lambardar). It introduced the concept of average rents for different soil classes. The state share of the revenue was 66% of the rental value. The settlement was agreed upon for 30 years. This system largely prevailed in Punjab, Agra and Awadh. The Mahalwari System was an important innovation in the land revenue system under the British rule. It was the recognition of a subtler form of property right than that of the absolute ownership concept. This system was called the Modified Zamindari system because the village headman became virtually a Zamindar.

Tenure system	Presidency	Features
<b>Permanent settlement</b>	<ol style="list-style-type: none"> <li>1. Bengal</li> <li>2. Bihar</li> </ol>	<ul style="list-style-type: none"> <li>• Cornwallis + John Shore. In Bengal + Bihar. 1793</li> <li>• Company 'outsourced' the revenue collection work to Zamindars</li> <li>• Very exploitative. Led to many revolts. Hence British didn't implement it in</li> <li>• other parts of India.</li> <li>• <b>In Awadh/Oudh</b>, Lord Delhousie wanted to implement Mahalwari but then</li> <li>• 1857's munity broke out. Later Lord Canning introduced <b>Talukdari</b> system</li> <li>• similar to Permanent settlement.</li> </ul>
<b>Ryotwari</b>	<ol style="list-style-type: none"> <li>1. <b>Madras</b>,</li> <li>2. <b>Bombay</b></li> <li>3. <b>Assam</b></li> </ol>	<ul style="list-style-type: none"> <li>• Thomas Munro and Read in Madras. (1820)</li> <li>• Wingate and Goldsmid in Bombay (1835). In 1820 it was tried in Poona but</li> <li>• failed. Later Wingate and Goldsmid start Bombay Survey System in 1835 for</li> <li>• individual settlement system.</li> <li>• Company directly collected revenue from farmers.</li> <li>• Madras was initially under Permanent settlement type system but Thomas</li> <li>• Munro convinced the directors of East India company to convert this area</li> <li>• underRyotwari / direct settlement system.</li> </ul>
<b>Mahalwari</b>	<ol style="list-style-type: none"> <li>1. Gangetic valley</li> <li>2. north-west provinces,</li> <li>3. parts of central India</li> <li>4. Punjab</li> </ol>	<ul style="list-style-type: none"> <li>• Company 'outsourced' revenue collection work to Village community itself</li> <li>• -Technically village headman (Lambardar) was made responsible for tax collection</li> <li>• North West Provinces initially had Permanent settlement but transformed to</li> <li>• Mahalwari system by Holt Mackenzie.(1822)</li> </ul>

As a result of the above factors, India has been facing agrarian crisis under the colonial rule in one form or other. There was the increasing landlessness of the peasants accompanied by frequency of famines and shortage in the production and supply of food materials. Absentee landlordism was considered as the greatest barrier in the development of the agrarian structure in the country. Important changes have been brought in terms of tenancy and land ownership in the country after independence.

**To do activity** Find out the type of relationship existing between Zamindars and agricultural labourers in your region. Is this exploitative? Also suggest some solutions to improve their conditions.

## 5.2 Land Tenure Systems and Agrarian Structure Part I

The concept of agrarian system is based on relationship between the people, the groups of people and land as systemic unity. Daniel Thornier in his book "The Agrarian prospects in India" has used the term "Agrarian Structure" as the sum total of ways in which each group functions in relation to other groups.

The system of land tenure governs the traditional or legal rights of individual or groups on land and its consequences on the social relationships of rural population. Land tenure systems in India handed down as a colonial legacy was rooted in exploitation of the large majority of rural population and a big section of those who did not having access to land.

After independence it was considered necessary to introduce several measures to change land tenure systems with a view to provide opportunities for the development of every section of agrarian rural society. These measures of change in land tenure systems have introduced the elements of transformation in agrarian structure prevalent during colonial rule.

Consequences of the British land revenue systems

- Land became a commodity.
- Earlier there was no private ownership of land. Even kings and cultivators did not consider land as his 'private property'.
- Due to the very high taxes, farmers resorted to growing cash crops instead of food crops. This led to food insecurity and even famines.
- Taxes on agricultural produce were moderate during pre-British times. The British made it very high.
- Insistence on cash payment of revenue led to more indebtedness among farmers. Moneylenders became landowners in due course.
- Bonded labour arose because loans were given to farmers/labourers who could not pay it back.
- When India achieved freedom from colonial rule, 7% of the villagers (Zamindars/landowners) owned 75% of the agricultural land.

### Agrarian Structure in Pre-British India

Indian rural society was self-sufficient village community based on agriculture. Agriculture and allied activities were carried on with the primitive tools and handicrafts. Village as a self-sufficient basic economic unit had existed for centuries in India. Village in India was like 'little republic' having nearly everything they required within themselves and almost independent of any 'foreign' relations.

The village population was mainly composed of farmers. The farmer's family enjoyed a traditional hereditary right to possess and cultivate its holdings from generation to generation. During the period of Hindu rulers, the land belonged to the village community and was never regarded as the property of the King. The king or his intermediaries claimed only a part of the produce of the land.

- **Economic Features** In Indian villages, the structure of agricultural production remained untouched for centuries. The entire agricultural produce was almost consumed locally by the agriculturists and non-agriculturist village population, except the share of produce which the village had to surrender to the ruler of that period. The village population besides the farmer's families included industrial workers, such as a smith, a carpenter, a potter, a weaver, a cobbler, a washer man, an oilman, a barber and others.
- **Social Features** So far as the Indian agrarian structure was concerned, conquests not affected it. The pre-British Indian society was characterized by subordination of the individual to the caste, the family and the village panchayats. Rigidity caste system exist with the inexorable force of natural law, determined the occupation of its members of the village community. Since castes were based on heredity, occupation also became hereditary.

The agrarian structure in India during pre-colonial period can be summarized at its best in terms of O'Malley-

"The chief social institutions, as they existed in their integrity, were not individualist but collectivist. The unit was not individual but the family which regulated the relations of its members. The interrelations of different families were governed by the village community and the caste, the former of which was a collection of families organized for the purposes of communal self-government, while the latter was an aggregation of families united by rules as to marriage, diet, occupation and intercourse with the rest of community but not localized like the village community. All three, the family, the caste and the village community maintained ideological control over the individual who was bound to conform to their standards, the affairs of the caste and family, however; were matters with which the state had no direct concern. The relations of their members were governed not by secular but by Hindu laws and customary regulations."

### **Agrarian Structure during British Rule**

The political and economic policies adopted by the British government after 'the conquest of India introduced the elements of transformation in Indian economy and society. Before British conquest of India land belonged to the village community and was never treated as the property of the kings - benevolent or despotic, Hindu, Muslims or Buddhist. Nor it was treated as individual cultivator's property. In short in pre-British India the private ownership of land did not exist in any form. Land belonged to the village community.

British conquest introduced the concept of private property in land by superseding the traditional right of village community over the village land. In a sense of British conquest brought about an agrarian revolution. The introduction of private ownership in land divided village community mainly into peasant ownership and large scale landlord ownership. As a result of this material transformation the agrarian society in India witnessed profound social, economic, political, cultural and psychological change. Under the new land system, the village was no longer owner or supervisor of agriculture. It had little to do with the disputes related to land which had become the subject of courts established by the British. This greatly undermined the prestige of the panchayats which lost power. The new land revenue system created individual holders of land and introduced the system of individual land assessment and revenue payment.

A new method of fixing the land revenue and its payment was introduced and the new land system and revenue system played an important role in snapping the traditional tie between the peasant and the village community. Consequently, the self-sufficient nature of village community received a serious setback. The coexistence of village agriculture and industry which the basic pillar of the self-sufficient village economy, was disrupted. The Centralized state took over the functions of the village community.

The village slowly but steadily became transformed from self-governing community to an administrative unit of centralized state the economic aspect largely a part of the national economy. The collective village life based on common economic interests and the resultant cooperative relations could not be sustained under the new arrangement. Ultimately it gave way to a new village where existence was based on competition and struggle among independent individuals.

### **Impact of British Rule in Eastern and Western Parts of India**

**Eastern India** The East India Company took over the Diwani (financial rights) of Bengal, Bihar and parts of Orissa in the year 1765. The Company required large amount of money to finance trade and commerce, and to maintain the army for strengthening and expansion of the rule. To realize the objective of higher land revenue, the zamindari was auctioned to the highest bidder. This reckless process was followed by frequent famines, loss of human life and large areas of land were rendered as waste. The impact on agrarian society can be assessed from the fact that between 1765 to 1793 the revenue demand nearly doubled.

The Permanent Settlement of 1793 in Bengal and Bihar, besides declaring the zamindars, proprietors of the soil, fixed their dues to the state on a permanent basis. It was argued that it would ensure not only the security of revenue, but also lead to the prosperity of the Company's commerce. A thriving commerce was the vital need of the British and Indian agriculture provided variety of goods for export. This period was of special significance because it was the time of the commencement of the Industrial Revolution in Britain.

Moreover, behind these measures another objective was the creation of a new class, loyal to company as 'zamindars' which will help in the stabilization of British rule in India. However, their expectations were only partially fulfilled, in so far as the zamindars, new as well as old, failed to turn into agrarian capitalists, and preferred to remain feudal landlords. Capital was invested not in agricultural development but for purchasing of land. Moreover, in due course of time, a long chain of intermediaries cropped up between the state and the tiller.

However, with increase in prices, the value of money was eroded. As a consequence, state and peasants both were in no-win situation. The state lost because its revenues in terms of money were permanently fixed, while the value of money had drastically fallen. The peasant lost because rents were not regulated and the increased value of agricultural produce went to the zamindars and the intermediaries.

It was realized that the freezing of the land revenue demand, which constituted by far the most important source of the government income at that time, would not be advisable. Both in Orissa and Assam settlements were kept temporary and the revenue demand was increased from time to time. In Orissa, between 1805 and 1897, the government increased the land revenue to around 93 per



cent. In Assam, the peasants surrendered to the State a larger proportion of their total agricultural output. Since the British had their district professional army and an elaborate administrative bureaucracy, the labour services of the paiks became redundant. The paiks were given a cash tribute, which was quite high as compared to the nominal tax on paik's land during Ahom rule. Their revenue-free estates were gradually confiscated.

**Western India** The system of revenue collection adopted in Western part of India was basically the ryotwari system, but other systems of land revenue were also in practice. In this system, the settlement was normally for a fixed period of 30 years, which meant that the revenue demand could be enhanced after that period. Under the ryotwari settlement, the ryot cultivator was directly under the state, was recognized as proprietor and had right to sublet, mortgage or transfer his plot of land by gift or sale. He could not be ejected so long as he paid the fixed revenue. With the introduction of the new land revenue system in Western India; the 'miras' and 'upari' tenures were merged and the occupant of the land had the same right irrespective of their earlier status. The hereditary village and higher officials were prohibited from collection of customary perquisites from the people. In addition to this, exclusion of these hereditary officials from revenue administration also tended to lower their independence. The new system (ryotwari) adopted cash system of revenue.

### **Changes in Agrarian Society**

During 1860, there was a sharp rise in prices of agricultural commodities, specially of cotton. The first to benefit from the boom were the traders and moneylenders, but cultivators also got some benefit. Farmers, who were relatively well off concentrated on cash crops, because of the increase in prices. The farmers who were comparatively less well-off tended to cultivate food grains where price situation led Tenure Systems and was relatively stable. Thus, the incidence of land revenue on the rich farmers Agrarian Structure-I declined faster than for the less well to do farmers.

Increasing indebtedness of the cultivators culminated in the Deccan riots in 1875 against moneylenders. In addition to heavy land revenue demand, the new legal system had also given the village moneylender more freedom. But in the new legal system the British courts were much more rigid in enforcing the land transfer and the cultivators were often ignorant of the new laws. In the beginning the business moneylenders were mainly interested in control of crops and trade. By the mid nineteenth century the moneylenders controlled nearly all the internal trade of both grain and cotton in the Deccan. Their interest was also to preserve this control through advancing loans to the peasants who were required to sell their crops to them at a much lower price than prevailing market prices.

The cultivation of cash crops such as sugarcane, tobacco, groundnut and cotton expanded during the late 19' and early 20th centuries, leading to the emergence of rich peasantry. The small section of the cultivators who had a surplus produce for market, made large profits, and invested them back into agriculture. These rich farmers, who had been able to seize the new market opportunities, often replaced the traditional moneylenders as sources of credit in the village. Very often these commercialized agriculturists purchased the land of small cultivators, who were in heavy debt.

Data collected for the Royal Commission on Agriculture showed that in 1924-25, 86 per cent of the total cultivated area was held by large owners each having more than 25 acres, and they formed just

12 per cent of the total landowners. It seems that well-to-do owner cultivators started withdrawing from cultivation and leased out their land during the first half of the twentieth century. In Gujarat land owned by non-cultivating holders increased from 24 per cent to 30 per cent of the agricultural area between 1916-17 and 1942-43, while their number rose from P 65,000 to 1,01,000. Most of these tenants were tenants-at-will. The majority of tenants in Maharashtra paid in kind; the general rate was half the crop, with the landlord paying the land revenue. This system was particularly advantageous to the landlords when prices were rising.

**To Do Activity** Find out what is the major source of irrigation in your local area. Is it tank irrigation or tubewell or canal irrigation or the agriculture is rain fed?

#### **Glossary**

**Agrarian Structure** It takes into account every conducive factor that is responsible for the sustained growth in the agricultural sector. Agrarian Structure involves the social, economic and technical elements that affect production in the agricultural sector.

### **5.3 Land Tenure Systems and Agrarian Structure Part II**

The outcome of the land settlements instituted by the British can be summarized as

- It created a class of parasitic landlords, moneylenders, land speculators and Waders. They dealt mainly with agricultural produce and started playing an important role in the governance of countryside. This class was not interested in any productive investment or agricultural development.
- It promoted commercialization of agriculture especially in the areas producing for export.
- It turned land into a private property. It made it possible that land could be alienated from the cultivators, throughout the country. The parasitic elements who were controlled the countryside had dominant hold on surplus produce generated by the cultivators.

#### **Impact of British Rule in Northern and Central India**

In Northern India various kinds of land tenure systems were inter mixed as both Zamindari and Mahalwari systems were introduced in this region. Initially, Bengal type permanent settlement was favoured, but after 1811, considerations of enhancement of revenue led to the abandonment of fixed revenue system, and even in the case of zamindari areas only a small proportion of land was under permanent settlement, the rest were settled temporarily.

In Punjab and parts of United Provinces, Mahalwari system was introduced where the unit of assessment was the village. In this system payment of revenue became the joint responsibility of the village proprietary body. Each individual cultivator contributed his share in the revenue. Initially the burden of revenue was very heavy. The British laid claim to about 85 per cent of the rental. In principle it was reduced to two thirds after 1833 and to one-half after 1855, but in actual practice this principle was not adhered to.

From the very- beginning British government wanted to extract maximum revenue from the central parts of India and for this region heavy assessment was imposed by the British. High assessment land and an impossible revenue, impoverished the people. The mistake was realized at a later date and

was condemned in the strongest terms. It was only in 1834 that a long settlement for twenty years was concluded in these territories, which was allowed to continue till the early 1860s.

Under the new settlement of 1864, that was introduced in the Central Provinces, malaguzars or revenue-payers were recognized as the proprietors of the soil with a right to sell or mortgage their property. Tenancy rights were conferred on the Agrarian Structure cultivators. In principle it was decided that the land revenue would be limited to one-half of the rental of estates, but the principle was not adhered at the time of assessment. They estimated what the rental should be from their own calculations, and based the land revenue demand on the estimated rentals. Thus, the rental considered as the basis of assessment was higher than the actual rents received by the land owners. As a result, land revenue demand was higher than 50 per cent of actual rental.

#### Impact of Land Revenue System

- Land revenue was to be paid in cash, not in kind.
- Secondly, the amount of revenue was kept fixed for a period of twenty or thirty years, under the permanent settlement. Consequently, the revenue of the state did not increase.

On the other hand, the payment of revenue in cash generated a pressure on the cultivators. They were forced to produce cash crops like indigo, sugarcane and wheat, and had to borrow money for payment of tax or took advance from the village moneylenders of the local grain dealer-cum-moneylender.

The transfer of ownership of land was massive and fast. These mutations were effecting a rapid and complete revolution in the position of the ancient proprietors of the soil. Behind this alienation and mortgage of land, there emerged a serious and much larger problem of indebtedness. It was estimated that 10 percent of agricultural land had already passed into the hands of, what district officers termed, as 'the wily mahajan' and 'sleek, impassive bania'. Yet official opinion remained opposed to any tampering with free trade in land because of the fear that legislative interference might seriously upset the provision of rural credit and jeopardize the security of the land revenue.

Similarly, by the time of the 1864 Settlement in the districts of Central Provinces, almost the whole of the profits was taken away by the moneylenders. While mortgage was growing rapidly, decrees were being carried out through 'the civil courts in the 1870s. Continuous transfer of land from cultivators to moneylenders prompted legislation in the shape of Bundelkhand Alienation Act of 1903. But despite the Alienation Act the professional moneylenders in Bundelkhand remained a permanent part of the rural scene and kept their hold over the peasants. Moneylenders-cum-traders were more interested in receiving rent or in controlling the disposal of cash crops grown by the peasants than directly engaging in agricultural. Thus the introduction of legal private property right in land tended to enhanced the claim of intermediaries above the actual cultivator and left the peasant based small scale traditional cultivation intact. The expectation of the British of the emergence of capitalist agriculture, which would benefit from the economies of scale, did not materialise.

#### **Agrarian Structure after Independence**

The agrarian structure which was marked, on the one hand, by the concentration of land ownership

in the hands of parasitic class who played no positive role in the production and, on the other, had divorced the landownership from the vast mass of peasantry who were the actual cultivators. Therefore, a radical measure in the form of land reforms was required to bring fundamental changes in rural social structure and economy.

In India, land reforms were initiated as an attempt to alter the pattern of distribution of land holding through radical measures by the state. The measures of land reforms policy have been prominently laid down in the Five Year Plan documents.

### **The main objective of the reforms policy may be summed up as**

- To remove mutational and other impediments to increase agricultural production
- To eliminate all elements of exploitation and ensure social-injustice within agrarian system.

The land reforms have been considered as the number one priority area in the whole range of agricultural development activities and have been on the national agenda of rural construction has been constantly recognized in the successive Five Year Plans. Government of India has been continuing play its advisory role in the field as the subject is in the state list of the constitution and is in exclusive legislative and administrative jurisdiction of the States.

The Land Reforms Division of the Ministry of Rural Development has been playing a crucial role for evolving a national consensus at various stages for taking up major steps towards effective land reforms which included the abolition of Zamindari and of all the intermediaries since the beginning of fifties. The Centre and State government have, as a result, adopted important strategies for rural development by effecting major reorganization of socio-economic structure through land reforms.

### **The land reforms programme strives to fulfil all the principles of National Land Reforms policy which consists of the following measures**

- Abolition of intermediaries and bringing the tenants in direct contact with the government
- Tenancy reforms with a view to provide security of tenure to actual cultivators of land against eviction and regulation of rents
- Redistribution of land by imposing ceiling on agricultural holding
- Consolidation of holdings
- Prevention of alienation/restoration of alienated tribal land
- Updating and computerization of land records

Though the Centre and State governments have initiated several meaningful measures related to land reforms, there is still a wide gap between the proclaimed objectives and the actual outcome.

After the 73rd Constitutional Amendment Act 1992, Panchayati Raj institutions have become very important. The nature of the land problem varies from state to state and even from region to region, and in introducing the Land Reforms a flexible approach has been adopted to suit and respond to the differing local requirements. The ideological and political factors and the way the ownership and the use of land is interlocked with the power structures have been matters of great importance and significance.

The first phase of post-independence land reforms in 1950s and 1960s yielded mixed results. It could be termed successful in the sense that the intermediaries were abolished, which provided the basis for improvement in agricultural productivity. Nevertheless, the unequal agrarian structure remained in place. In 1953-54 nearly 8 percent of ownership holding accounted for 54 percent of the total

land. However, at the all India level there was tendency towards unequal power structure in terms of land ownership. Although the average size of holding declined from 2.39 hectares in 1993-54 to 2.21 hectares in 1971 in several states, the average size of large farms increased.

- Pattern of Ownership Holdings It may be noticed that nearly 310 million acres of land were estimated to be owned by rural households in 1953-54. This was nearly 38.4 per cent of the total geographical area and 61 per cent of the topographically usable land. A certain proportion of land in the rural areas, no doubt, was owned by urban households.

The owned area of 310 million acres was held by 66 million households. The average size of ownership holdings in the rural areas was around 4.72 acres. But when we look at the size of distribution of holdings, the situation is far worse. Nearly 22 per cent of the households in the rural areas did not hold any land. These households constituted the cultivating small tenants.

The average size of holding was the lowest in South India (about 3.42 acres), while it was the highest in Central India (about 8.29 acres). It may be pointed out that, the efficiency of cultivation which depends on appropriate combination of different factors of production.

- Pattern of Operational Holdings "Operational" or "cultivation" holdings refers to the operational holdings that is more appropriate to the efficiency of agricultural operation. Theoretically, even with a very adverse distribution of ownership, through a process of leasing in and leasing out, it is possible to have a pattern of operational holdings, less inconsistent with the dictates of efficient technology, or with the requirements of the laws of returns, or of returns to scale.

Although a small decline in concentration of land took place after the land reform legislation, land distribution remained highly skewed. In 1953-54, the bottom 60 per cent of holdings operated 15.5 per cent of area while in 1960-61 the bottom 62 per cent of holdings operated 19 per cent of area.

### **Consequences of Land Tenure Systems on Agrarian Society**

The major changes introduced by the British rule were the new land revenue systems, high rates of revenue, new administrative and judicial system, which not only damaged the management of the villages, but introduced major changes in the Indian socio-economic and legal systems also.

- The functions of gram panchayat in the fields of land management and judicial function were taken away. As a consequence, the old social, economic and political institutions prevalent in the Indian village were destroyed.
- Due to the destruction of small village industries and crafts, land acquired much importance.
- Both the ownership of land and farmers became mobile bringing in the absentee landlords and moneylenders on the villages.
- The land revenue was very high in both the zamindari and the Ryotwari systems and when zamindars or ryotwars were not in a position to pay revenue in time, the British took away the lands from them and sold it to businessmen.
- Majority of the farmers stopped farming and land became sterile/unproductive. The number of sharecroppers and landless farmers increased significantly.
- The British land tenure system of Zamindari, Ryotwari and Mahalwari destroyed the self-sufficiency of the Indian villages and brought fundamental changes in the rural social and economic life which were often damaging to the old customs.

- The land revenue was increased from 66 percent to 100 percent after American civil war. The farmers had no right to appeal in the court of law.
- The creation of a class of zamindar provided social support for the colonial government and made it easier to impose control over the rural population.
- The expansion of British rule and the requirement of more and more money led to the increase in land revenue. It made agricultural production costly ultimately resulting into agricultural backwardness. High level of revenue, costly agricultural production put farmers into high debt.

**To Do Activity** Find out the changes which are brought to agriculture sector in terms of technology in your surrounding area. Find out the number of families which have access to latest technology.

#### 5.4 Land Reforms in Independent India

Land Reforms refer to an institutional measure directed towards altering the existing pattern of ownership, tenancy and management of land. It entails “a redistribution of the rights of ownership and/or use of land away from large landowners and in favour of cultivators with very limited or no landholdings.”

Thus, in a broad sense, land reform refers to an improvement in agro-economic institutions. It includes measures and policies relating to redistribution of land, regulation of rent, improving the conditions of tenancy, cooperative organisation, agricultural education, and so on.

<b>Aspects of Land Reforms in India</b>	
British Land Tenure Systems	Permanent Settlement, Ryotwari System, Mahalwari System
Steps taken by Indian Government	Land Acquisition Acts, Compensation for land holdings, Modernization of National Land Records
Movements related to land reforms	Bhoodan Movement, Jan Satyagrah, Gramdan Movement, Forest Rights Movements
Land reforms after independence	Abolition of Zamindari System and other titles

**Figure 5.3 Different Aspects of Land Reforms**

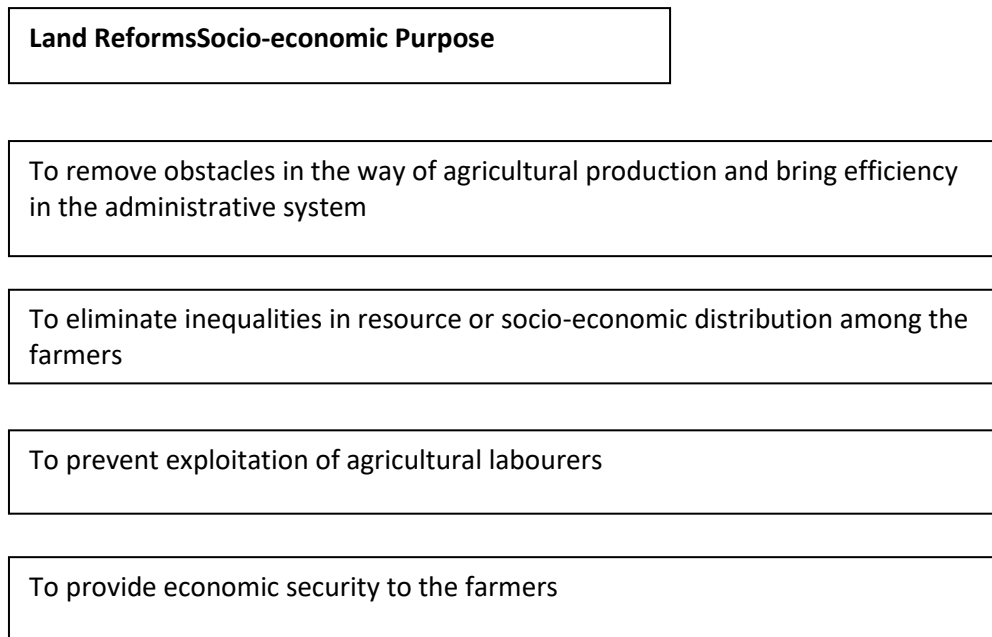
#### Need and Scope of Land Reforms

Productivity in Agriculture is mainly dependent on 2 set of factors-

- 1) Technological It includes use of agricultural inputs and methods such as improved seeds, fertilizers, improved ploughs, tractors, harvesters etc. which help to raise productivity.
- 2) Institutional It includes redistribution of land ownership in favour of cultivating classes so as to provide them a sense of participation in rural life, improving size of farms, providing security of tenure.

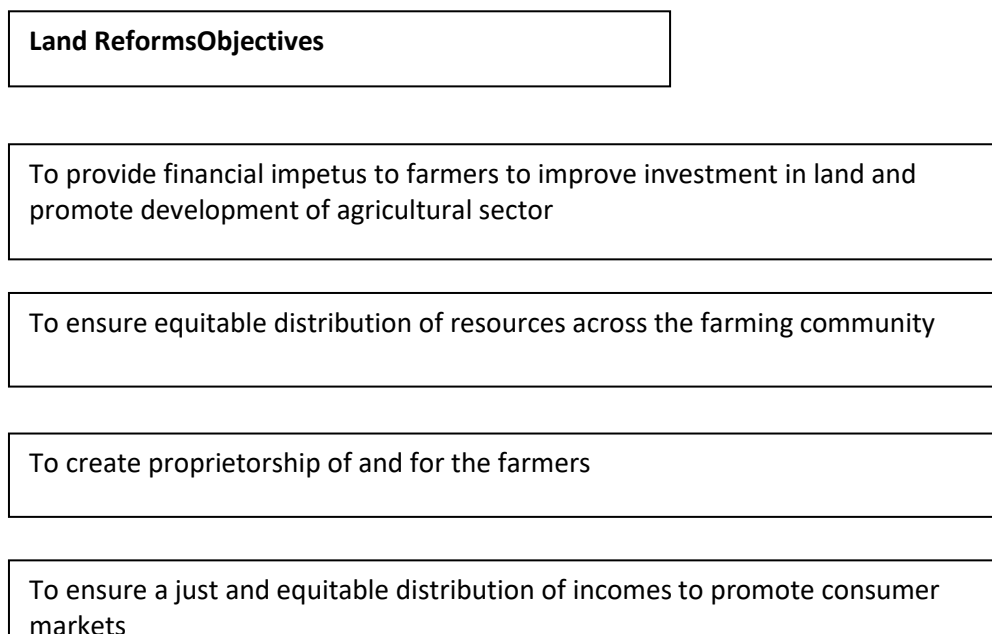
Consequently, 2 schools of thought emerged. Socialists believe that existence of feudal relations was the real cause of backwardness and poverty. Other school believes that agricultural productivity is purely a technological phenomenon.

### Land Reforms Purpose



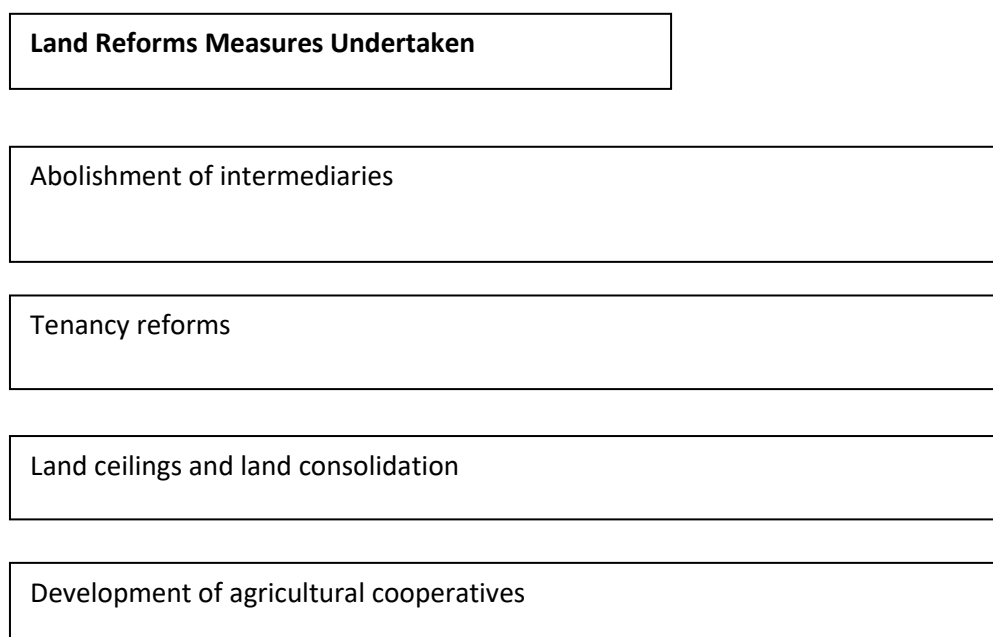
**Figure 5.4 Purpose of Land Reforms**

### Land Reforms Objectives



**Figure 5.5 Objectives of Land Reforms**

## Land Reforms Measures



**Figure 5.6 Measures taken during Land Reforms**

(i) Abolition of intermediaries Abolition of zamindari and similar intermediary tenures during 1950-55 essentially involved removal of intermediary levels or layers of various amorphous and parasitic groups in land between the State and the actual cultivators. However, such abolition of intermediaries involved compensation to the owners of land.

As a result of this measure, about 2.5 crore farmers were brought into direct relationship with the State. This facilitated distribution of 61 lakh hectares of land to landless farmers. Large areas of privately-owned forests and wasteland now vested in the State.

Despite abolition of intermediary rights, poor peasantry continued to be exploited in various ways. It led to large-scale ejection of poor tenants from land. While landlordism has been abolished, absentee landlordism now continues to flourish. The legislation conferred ownership rights not upon the actual cultivator, but on the statutory tenant, who himself was an intermediary with a chain of sub-tenants under him.

All this happened because

- The law permitted the intermediaries to retain their home farms,
- No limit was put on the area of land they could retain,
- The term 'personal cultivation' was ill-defined, and
- No protection was given to sharecroppers and other tenants-at-will.

Thus, the abolition of intermediary rights on land has not been an unmixed blessing.



## (ii) Tenancy Reforms

Tenancy legislations have taken three forms

- Regulation of rent
- Providing security of tenure
- Conferring rights of ownership for tenants

Rent payable to the landowners should not exceed one-fifth to one-fourth of the gross produce of land. In the light of this guideline, all the states have enacted laws for fixation of rent. However, large inter-state variations exist in the fixation of land rent rates. Further, one notices inter-state differences in land rents.

Even the tenancy reforms have failed to regulate rent. Owing to the weak position of tenants, demand for fair and just rent from landowners occasionally lead to ejection from land. Tenancy Legislations have made it clear that in no case the tenants can be evicted except only in the situation where landlords themselves want to resume cultivation. Even in the event of resumption of cultivation by the owners, tenancy legislations have made it obligatory to leave a minimum area for the tenant.

Every important aspect of land reform is the conferment of ownership rights to tenants in respect of non-resumable land. As a result of this measure, by 2000, only around 124.2 lakh tenants operating no more than 4 p.c. of the cultivated area have been benefited from this ownership rights or their rights have been protected on 63.2 lakh hectares of land.

Overall impact of tenancy reforms has been rather limited. Firstly, tenancy laws have been violated. For instance, in Bihar, the maximum limit of rent was kept at 25 p.c. of the gross produce. But tenants are required to pay even more than 50 p.c. as their social standing is abominably low. Secondly, as regards the security of tenant- cultivator, escape clauses have been misused against the interest of tenants.

Tenancy laws that have been framed in different states contained a provision for the resumption of land by the landowners for 'personal cultivation' with the object of protecting the interests of landowners, rather than tenants.

Due to a loose definition of the term personal cultivation, landowners continued to resume land for self-cultivation. The law also permitted the voluntary surrender of tenancies. Informal or concealed and oral tenancies are still prevalent.

Thus, the right of resumption of land for self-cultivation has rendered all tenancies insecure. Finally, there is no legal provision for conferring ownership rights in the tenancy laws of some states. In reality, legislation for conferment of ownership rights could not yield good results because many tenants are incapable of buying land from the landowners and many of them are unwilling to do so.

(iii) Ceiling on Landholdings The Second Plan (1956-1961) recommended the imposition of ceilings on agricultural holdings. It was envisaged that land above a certain limit would be acquired by the State and redistributed among the landless workers and small farmers so as to meet their hunger for land and, thus, to enable them to create economic holdings.

Land ceiling laws were passed in two phases. In the first phase—which lasted up to the end of 1972— ‘landholder’ was treated as the unit of the cultivation. This ceiling unit was changed to ‘family’ after 1972. The ceiling limits have also been lowered in the second phase with differences varying as between irrigated land with two crops, irrigated land with one crop, and dry land.

Up to end September 2001, the total amount of land declared surplus was 73.67 lakh acres, 64.95 lakh acres of land have been taken over by the states. A total of 53.79 lakh acres of land have been distributed among 54.84 lakh tenants. This amounts to saying that about 12 lakh acres of land could not be distributed because of variety of reasons, of which litigation is considered to be the most inhibiting factor.

#### Why Land Ceiling? Argument against Land Ceiling

<b>Arguments Against Land Ceiling</b>	
<b>Reduced Economic Efficiency</b>	Larger farms have an edge over small holdings because cost of production per hectare is reduced due to increased resources Larger inputs can ensure better access to technology to improve production
<b>Lesser Employment Opportunities</b>	Farm labourers will lose their jobs if land is redistributed into smaller parts Small farmers may not be able to afford more labourers as small holdings will mean smaller incomes

**Figure 5.7 Arguments against Land Ceiling**

The operations of the ceiling law made virtually no impact on the agrarian structure. The enforcement of the ceiling law was preceded by a public debate spread over several years. This enabled landowner to manipulate land records leading to fictitious (benami) and fraudulent partitions of lands among their relations, friends, fictitious trusts, etc.

As a result, only the small landowners were caught in the net and most of the big landowners or jotters circumvented it and, even if the land was taken from them, it was not redistributed among the landless peasants. Lack of political will is considered to be the greatest stumbling Chapter for its speedy implementation.

(iv) Consolidation of Landholdings Fragmented and subdivided landholdings as well as small-sized holdings have made Indian agriculture un-remunerative. So consolidation of these lands is necessary to boost efficiency and economy in India’s agriculture. It has been completed in the states of Punjab, Haryana and Uttar Pradesh.

Till December 2001, nearly, 163.3 lakh acres of land or 1 /3rd of the total cultivated area have been consolidated. Thus, the success story in this regard is rather disappointing. One of the reasons for the tardy progress of this aspect of land reforms is that small farmers have a strong fear that consolidation favours large farmers. That is why the threat of eviction of tenants from land out of consolidation is the greatest.

Why the Program Failed?

- Because the farmers are reluctant to exchange their lands for the new one.
- The farmers also complained about nepotism and corruption in the process of consolidation.

(v) Cooperative Farming Cooperative farming is advocated to solve the problem of sub-divisions of land holdings. The idea was to make farming profitable for small and marginal farmers having small pieces of land.

Under Cooperative Farming, setup farmers having very small holdings come together and join hands to pool their lands for the purpose of cultivation. Pooling of farms helps in increasing production, and the farmers can have more produce to sell in the markets after taking out their subsistence need. Cooperative farming also helps in mechanisation of agriculture as the owner of the multiple small farms can pool their money to buy a mechanical tractor or other equipment's which they could not afford otherwise.

Arguments in favour of cooperative farming –

- An effective method of making small uneconomic holdings profitable
- Cost reduction in inputs such as seeds, fertilizers, electricity
- Mechanization of farming
- More scope for technological innovation
- Efficiency in resource utilization
- Increase in labour wages
- Access to markets easy for farmers

**To Do Activity** Find out which type of land reform was implemented in your area. Also, figure out how successful it was in improving conditions of the poor.

**To Do Activity** Find out the average size of land holding in your area.

## 5.5 Implementation of Land Reforms Experiences and Prospects

Most of the planks of land reform measures are ambivalent and there are large gaps between policy and legislation and between legislation and implementation. And "land reform measures were conceived boldly but were implemented badly."

Land reforms have been half-heartedly attempted at various times and this has proved to be a case of the remedy being worse than the disease. Commenting on the process of land reforms, Prof. M.L. Dantwala observes; "By and large land reforms in India enacted so far and those contemplated in the near future, are in the right direction; and yet due to lack of implementation the actual results are far from satisfactory".

Joshi observes "There is no doubt that during the past twenty-five years land reforms in India have not assumed the form of gigantic revolutionary upheaval as in China, or that of a dramatic change brought about from above as in Japan. But from this to jump to the conclusion that the land reforms programme has been a hoax or a total fiasco is to substitute assertion for a detailed empirical examination. India has also witnessed important changes in the agrarian structure, which have gone

unnoticed because of the absence of a down-to-earth approach in assessing these changes.

The Government of India is aware that agricultural development in India could be achieved only with the reform of India's rural institutional structure. It was said that the extent of the utilisation of agricultural resources would be determined by the institutional framework under which the various inputs were put to use. M. Dandekar observed "Among the actions intended to release the force which may initiate or accelerate the process of economic growth, agrarian reform usually receives high priority". The First Five-Year Plan stated "This (land reform) is a fundamental issue of national importance. The former Prime Minister, Indira Gandhi, emphasised "Land Reforms is the most crucial test which our political system must pass in order to survive." Land reforms therefore became one of the vital aspects of the agricultural development policy especially after the concept of the Five-Year Plan came to stay.

The Second Five-Year Plan emphasised the objectives of the land reforms thus

- To remove the impediments in the way of agricultural production as may arise from the character of agrarian structure and to evolve an agrarian economy conducive of high levels of efficiency and productivity;
- To establish an egalitarian society and to eliminate social inequality;

Again, in the Third Plan, the Planning Commission summed up the objectives of land reforms thus "The first is to remove such impediments to increase in agricultural production as may arise from the agrarian structure inherited from the past. This should help to create conditions for evolving as speedily as possible an agricultural economy with a high level of efficiency. The second objective, which is closely related to the first, is to eliminate all elements of exploitation and social injustice within the agrarian system to provide security for the tiller of the soil and assure equality of status and opportunity to all the sections of the rural population". Thus the land reforms in India aimed at the redistribution of ownership holdings and reorganising operational holdings from the view point of optimum utilisation of land. It has also aimed at providing security of tenure, fixation of rents and conferment of ownership.

After Independence, attempts had been made to alter the pattern of distribution of land holdings on the basis of four types of experiments, namely;

- Land reforms "from above" through legislation on the lines broadly indicated by the Central Government, enacted by the State legislators, and finally implemented by the agencies of the State Government.
- Land reforms "from above" as in the case of Telengana and the naxalite movement also to some extent in the case of the "Land Grab" movement.
- Land reforms through legislative enactments "from above" combined with peasant mobilisation "from below" as in the case of controlled land seizure in West Bengal and protection of poor peasants in Kerala.
- Land reforms "from below" through permission of landlords and peaceful processions by peasants as in the case of Bhoodan and Gramdan.

The Zamindars acted as the intermediaries. Until Independence, a large part of agricultural land was held by the intermediaries under the zamindari, mahalwari and ryotwari systems. Consequently, the tenants were burdened with high rents, unproductive cultivation and other forms of exploitation.

By 1972, laws had been passed in all the States to abolish intermediaries. All of them had two principles in common

- 1) abolition of intermediaries between the state and the cultivator and
- 2) the payment of compensation to the owners.

But there was no clear mention about just and equitable compensation. Therefore, the Zamindari Abolition Act was challenged in the High Courts and the Supreme Court. But the Government accomplished the task of abolishing intermediary tenures bringing nearly 20 million cultivators into direct contact with the state. Nearly 57.7 lakh hectares were distributed to landless agriculturists after the successful completion of the Zamindari Abolition Act. The abolition also had a favourable economic impact on the country. By conferring the ownership of land to the tiller, the Government provided an incentive to improve cultivation. This paved the way for increase in efficiency and yield. This was an important step towards the establishment of socialism and the Government revenue increased. It also ushered in cooperative farming.

The efficacy of the legislation was, however, considerably reduced for the following reasons;

- The act did not benefit sub-tenants and share croppers, as they did not have occupancy rights on the land they cultivated.
- Intermediaries were abolished, but the rent receiving class continued to exist.
- Many landlords managed to retain considerable land areas under the various provisions of the laws. Benami holdings became the order of the day in many States.
- The problems of transferring ownership rights from the actual cultivators of the land, the tenants, the sub-tenants, share croppers, therefore, remained far from resolved.

Result, land reforms remain incomplete and unfinished.

After independence, the payment of rent by the tenants of all classes and the rate of rent were regulated by legislation. The first Five-Year Plan laid down that rent should not exceed one-fifth to one-fourth of the total produce. The law along these lines has been enacted in all the States. The maximum rate of rent should not exceed that suggested by the Planning Commission in all parts of the States. Maximum rents differed from one State to another - Rajasthan, Maharashtra and Gujarat fixed one-sixth of the produce as maximum rent. In Kerala, it ranges between one-fourth and one-third and in the Punjab one-third. In Tamil Nadu, the rent varies from one-third to 40 per cent of the produce. In Andhra Pradesh it is one-fourth for irrigated land. The rent could be paid in cash instead of kind.

With a view to ensuring security of tenure, various State Governments have passed laws which have three essential aims

- 1) Ejectment does not take place except with the provisions of law
- 2) the land may be taken over by the owners for personal cultivation only
- 3) in the event of resumption, the tenant is assured of the prescribed minimum areas.

The measures adopted in different States fall in four categories;

- First, all the tenants cultivating a portion of land have been given full security of tenure without the land owners having any right to resume land for personal cultivation. This is in operation in Uttar Pradesh and Delhi.
- Secondly, land owners are permitted to resume a limited area for personal cultivation, but they should provide a minimum area to the tenants. This is in vogue in Assam, Maharashtra, Gujarat, Punjab and Rajasthan.
- Thirdly, the landowner can resume only a limited extent of land and the tenant is not entitled to any part of it. This is operating in West Bengal, Jammu and Kashmir. In Tamil Nadu, Karnataka, Kerala, Andhra Pradesh and Orissa, measures in the form of an order for staying ejectments have been adopted to give temporary protection to the tenants.
- Fourthly, legislative measures have also indicated the circumstances under which only ejectments are permitted. These grounds are (a) non-payment of rent (b) performance of an act which is destructive or permanently injurious to land (c) subletting the land (d) using the land for purpose other than agriculture and (d) reclamation of land for personal cultivation by the landlords.

The ultimate aim of land reforms in India is to confer the rights of ownership to tenants to the larger possible extent. Towards this end, the Government has taken three measures

(1) declaring tenants as owners and requiring them to pay compensation to owners in suitable instalments

(2) acquisition of the right of ownership by the State on payment of compensation and transfer of ownership to tenants and

(3) the states' acquisition of the landlords' rights brings the tenants into direct relationship with the States.

One of the controversial measures of land reforms in India is the ceiling on land holding. By 1961-62, ceiling legislation had been passed in all the States. The levels vary from State to State, and are different for food and cash crops. In Uttar Pradesh and West Bengal, for example, the ceiling on existing holding is 40 acres and 25 acres and on future acquisitions 121/1 acres and 25 acres respectively. In Punjab, it ranges from 27 acres to 100 acres, in Rajasthan 22 acres to 236 acres and in Madhya Pradesh 25 acres to 75 acres. The unit of application of ceiling also differs from State to State. In Andhra Pradesh, Assam, Bihar, Punjab, Haryana, Uttar Pradesh, West Bengal, Madhya Pradesh and Maharashtra, it is on the basis of a 'land holder', whereas in the other States it is one the basis of a 'family'.

In order to bring about uniformity, a new policy was evolved in 1971. The main features were

- Lowering of ceiling to 28 acres of wet land and 54 acres of unirrigated land
- A change over to family rather than the individual as the unit for determining land holdings lowered ceiling for a family of five.
- Fewer exemptions from ceilings
- Retrospective application of the law for declaring benami transactions null and void; and
- No scope to move the court on ground of infringement of fundamental rights

Besides, national guidelines were issued in 1972, which specified the land ceiling limit as;

- The best land 10 acres
- For second class land 18-27 acres; and
- For the rest, 27-54 acres with a slightly higher limit in the hill and desert areas

According to the figures available till the beginning of the Seventh Plan, the area declared surplus is 72 lakh acres; the area taken over by the Government is 56 lakh acres; and the area actually distributed is only 44 lakh acres. Thus, 28 lakh acres of land declared surplus have not been distributed so far. Of this, 16 lakh reserved for specific public purposes. The process involved in the distribution of surplus land was complicated and time consuming thanks to the intervention of the court.

Several States have passed the Consolidation of Holdings Act. Statistics reveal that 518 lakhs of hectares had been consolidated in the country at the beginning of the Seventh Five Year Plan, which constitute about 33% of the cultivatable land. The food and the agricultural organisation (FAO), after studying the position in Punjab and Uttar Pradesh regarding the operation of the consolidation of holding act, remarked;" A significant reduction in the cost of cultivation, increased cropping intensity and a more remunerative cropping pattern were developed in these two States."

Assessed from the point of view of two broad objectives namely, social justice and economic efficiency, land reforms, one might say, has been partially successful. Since the adoption of land reforms, the pattern of ownership in the country is changed but one wonders whether it will ensure social justice in the country. Indian agriculture is in a stage of transition, from a predominantly semi-feudal oriented agriculture characterised by large-scale leasing and subsistence farming to commercialised agriculture or marker-oriented farming. Another noteworthy feature is the emergence of modern farmers who are substantial landholders and cultivate their land through hired labourers using new techniques.

One of the major negative features of agrarian transition in India is the continued concentration of land in the hands of the upper strata of the rural society. This has not undergone any change in the past five decades, despite the reforms. In fact, leasing in by the affluent farmer is common place.

An outstanding development of Indian Agriculture was the rapid growth of landless agricultural labourers. They constitute about 10 per cent of the agricultural population and make up about 25 per cent of the labour force.

On the question of increasing productivity, it is difficult to assess the exact contribution of land reforms because productivity has been more related to the technical revolution ushered in the Indian agricultural sector. There are many factors responsible for the tardy progress but important among them are the lack of adequate direction and determination, lack of political will, absence of pressure from below, inadequate policy instrument, legal hurdles, absence of correct-up-dated land records and the lack of financial support.

In order to achieve success, the Asian Development Bank has recommended a strategy on these lines; political commitment at the top, administrative preparedness including the improvement of

the technical design of enactments, the provision of financial resources and the streamlining of the organisational machinery of implementation, creation of necessary supporting service for the beneficiaries and finally the organisation of beneficiaries themselves.

**Economic Arguments in favour of land reforms-**

- Equity and Equality In a region of scarcity of resources, land reforms ensure a just distribution
- Smaller farms are more manageable and tend to be more productive
- Owner-cultivated land is more productive than land under tenancy

Reasons for Failure of Land Reforms
Lack of Political Will
Lobbying by rich farmers with large land holdings
Benami properties and fraud transactions
Loopholes in administration and poor redressal system
Fallow and uncultivable land

**Figure 5.8 Reasons for Failure of Land Reforms**

To sum up, land reform programmes implemented since 1948 have not led to any radical distribution of land or removal of some of the obstacles to raising agricultural productivity. Nevertheless, it should not be written off as a non- event’. It brought great changes. It did away with the numerous layers of parasitic intermediaries in almost all the states.

All the measures, however, have left untouched the bottom layer of the agrarian structure consisting of agricultural labourers, sharecroppers, except in the states of West Bengal and Kerala where left-wing political parties changed the destiny of the poor peasantry vis-a-vis the jotedars, are poor customers.

**To Do Activity** Find out the reasons for either success or failure of land reforms in your local area.

**Summary**

This Chapter gives an overview of how land tenure system evolved from Vedic times to British era and also explains different types of land tenure system existing during that time. Attempts have been made to analyse socio-economic features of agrarian society prior to the colonial rule. We noted that before the advent of British Rule Indian villages were self-sufficient and concept of private property was absent. British rule which introduced the concept of private property in land and commercialization of agriculture. In the process of evolution of land relations, a non-agriculturist community emerged which strengthened its grip on rural land and agricultural produce. Attempts have been made to acquaint you of various problems that emerged in the agrarian structure due to changes in land relations. In the last section, we have discussed the land reforms which were introduced to create an egalitarian society and to improve condition of poor peasants. A brief section is devoted to understand success rate of land reforms in their implementation and



achievement of objectives which concludes that land reforms had a negative effect on poverty, while the effect on productivity is mixed; major reason being lack of political will.

### Model Questions

1. What were the three kinds of land settlement during British rule in India? Briefly discuss their features and implications.
2. Discuss agrarian structure prevalent during pre-British period, colonial period and after India's independence. Explain how land relations changed during this course of time.
3. What are the major land reforms introduced in India? Discuss its objectives.
4. Give an appraisal of implementation of land reforms in India.

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Block 2

# Natural Resource Management, Watershed Management, and Sustainable Livelihoods

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## **Natural Resources Management – An Introduction**

Nature has bestowed us with many gifts. They are commonly called as natural resources. The natural resources have made this planet liveable and have supported the evolution and sustenance of living organisms. Natural resources are of utmost importance to all living beings particularly to humans. In this Chapter, we will be discussing about natural resources such as land, water, energy, minerals, forests and wildlife. Natural resources can be classified as physical resources or biotic resources and, in other terms, as renewable or non-renewable resources.

India is a vast country and is blessed with many natural resources. We will discuss some general features about India. The availability and distribution of these resources will be described in detail so that you can appreciate the resource wealth of our country. We are fortunate in having all the vital natural resources such as land, water, minerals and a large variety of living organisms. A brief discussion of various natural resources would form part of this subject. The consumption of natural resources is increasing because of many factors such as increasing population, increasing pace of development including industrialization, urbanization, mining and related activities etc. However, the amount of natural resources is limited, and they are depleting at a very fast rate. Thus, there is an urgent need for their conservation.

# Chapter 1 Introduction to Natural Resource Bases

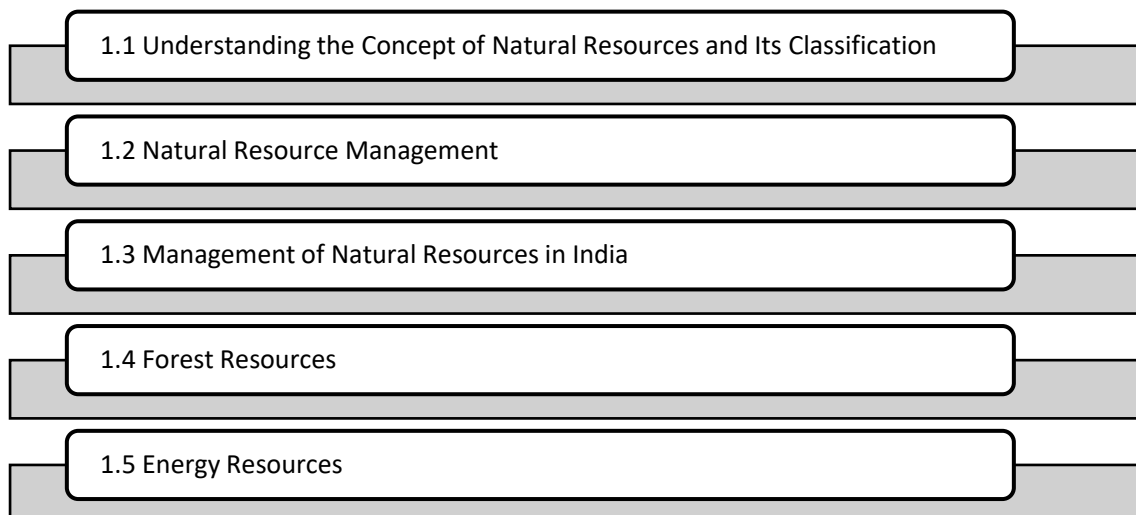
## Introduction

This Chapter focuses on natural resources, its nature, different types of natural resources and their classification with examples. Natural resources are classified into four water resources, solar energy resources, land resources, rock and mineral resources, and atmospheric resources. This Chapter deliberates on the four types of resources with a special focus on Forest and Energy resources.

## Objectives

- To define the term 'resource' and distinguish between different types of resources
- To explain the distribution of various natural resources and highlight their importance
- To understand various elements and strategies of natural resources management
- To give an in depth understanding of Forest Resources and Energy Resources

## Structure



This chapter is divided into five main sections. The first section deals with natural resources and its classification. The second section explains the concept of natural resource management followed by the third section which is NRM in India. The fourth section explains about Forest resources and finally the fifth section explains about Energy resources.

## 1.1 Understanding the Concept of Natural Resources and Its Classification

### Nature

The dictionary of Environment and Ecology (5th edition) defines Nature as “all living organisms and the environments in which they live”, and Resources in ecological point of view as “anything in the environment which can be used.” The word natural resources evolve from these two definitions. In order to comprehend the nature of resources, the natural resources in the environment must have to be unfolded.

## **Concept of Resource**

A resource is anything which is available from the environment in order to meet our needs and wants. Some resources can be directly used by us and examples of such resources are freshwater, air, plants and animals.

Natural resources are the raw materials available in the environment that organisms use for their existence. They may be either biotic (forests and wildlife) or abiotic (water, soil, air and minerals) in nature. The food you eat, the cloths you wear, and the roof over your head all of these are necessary for your survival and they come from natural resources. Natural resources are, of course, the physical bases for human life. The fertile farmland, for example, is a natural resource that supports food production. However, a fast flowing river is an example of a potential resource for producing hydroelectricity. In the case of fertile farmland and fast flowing river, useful products such as food and electricity can be derived, but the value of the wilderness area or mountain cannot be expressed in similar material terms. This is not to say that they have no value, but their value is of a kind different from that of the farmland and the river. The wilderness and mountains too are important natural resources. They are of enormous aesthetic value.

Natural resources can be defined as the resources obtained from nature which provides goods and services for human beings. It includes opportunities for recreation, appreciation of scenic beauty, and the disposal of wastes. Broadly speaking, natural resources can be categorized into three. The first category of resources consists of raw materials and energy resources used by humans and these are used as inputs into the economic system. Examples minerals, ores, coal and oil. The second category is the natural environment which provides the essential life support system for humans. It includes oxygen to breathe, water to drink as well as material goods such as food. Third category is another group of resources that comprises parts of the environment which provide services rather than material goods. They provide the sump into which the waste products of the economic system and human life are disposed. In addition to purification of air, other natural processes such as nitrogen fixation, soil formation and its fertility are very important for the survival of human beings.

## **Classification of Natural Resources**

Natural resources are categorized into various types based on the nature of their origin, stages of development, renewability and availability of resources. Examples of different categories of natural resources are interwoven. Different categories of natural resources and their examples are given below.

### **By Origin**

#### **1. Biotic Resources**

These are living resources which are capable of reproduction, or that can be replaced and thus increase. Example forest, agriculture, fish and wildlife.

#### **2. Abiotic Resources (or Physical Resources)**

These are non-living resources that do not replace themselves or their replacement happens at a slow rate so that its replenishment does not occur in human lifetimes. Example petrol, land and minerals.

### By Stages of Development

- a) **Potential Resources** Potential resources are those resources that exist in different regions around the globe and may be used in future. For example, petroleum is formed naturally in sedimentary rocks. It exists in many parts of the world, it is mined or drilled out and put into use and remains a potential resource.
- b) **Actual Resources** Actual resources also known as developed resources are those resources of which the stock and reserves have been surveyed, their quantity and quality determined and are being used in present times. For example, the development of an actual resource such as wood processing depends upon the technology available and the cost involved. That part of the actual resource which can be developed profitably with available technology is called a reserve.

### By Availability

In terms of availability, resources could be classified as inexhaustible and exhaustible resources.

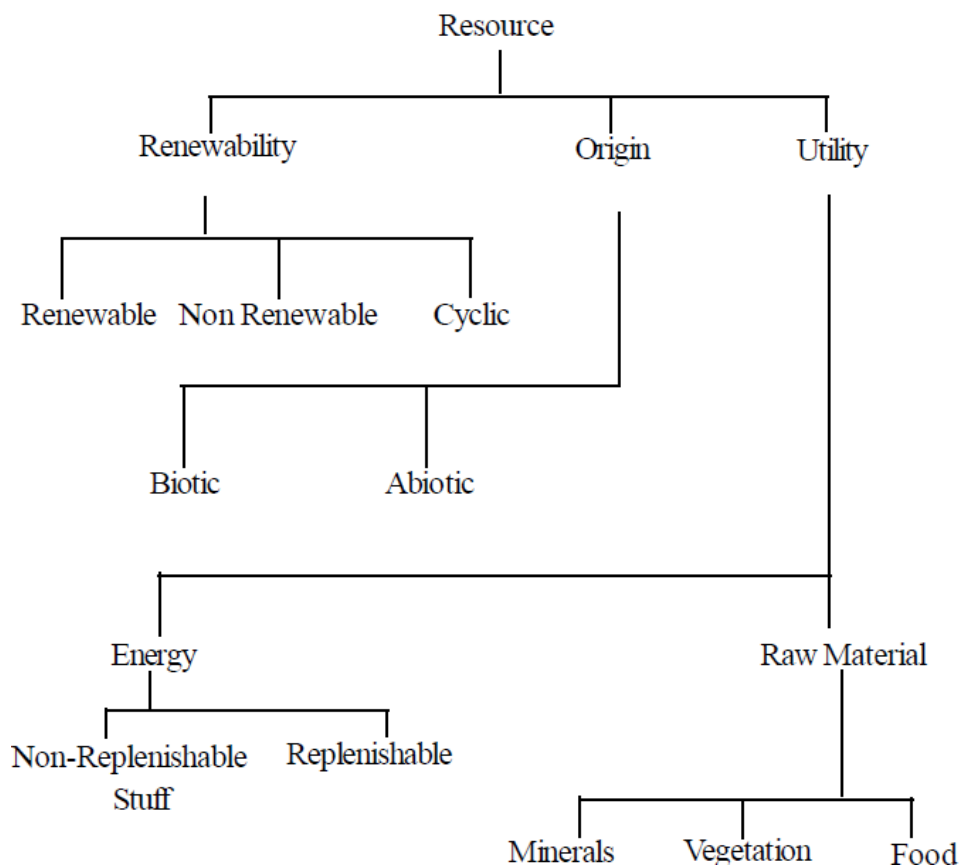


Figure 1.1 Classification of Resources

### By Renewability

Based on renewability, natural resources can be categorised as renewable and non-renewable resources.

- 1) **Renewable Resources**

Renewable resources are otherwise termed as inexhaustible resources. They can replenish themselves by various means like recycling, reproduction and replacement. Examples of renewable resources are sunlight, animals and plants, soil, water, etc.

## **2) Non-renewable Resources**

Non-renewable resources are the resources that cannot be replenished once used or perished. Examples of non-renewable resources are minerals, fossil fuels, etc.

Resources can also be classified as flow resources and stock resources. Those resources which are permanently available (at least on the human time scale) and in a continuous supply are known as flow resources. Examples solar energy, water. On the other hand, the stock resources are those whose quantities are fixed, and they keep decreasing with human use. Examples fossil fuel deposits, mineral deposits etc. Flow resources are not affected by human use while stock resources can be modified very easily in the course of their human use.

There is another category of natural resources which is aesthetic or amenity resources. Examples solitude, the scenic beauty and peaceful surroundings. As population surges and people look forward to getting away from the crowd, aesthetic resources become more relevant.

Some examples of natural resources are given below.

- Atmosphere which include air, wind
- Animals which comprises of wildlife, game reserves
- Land that comprises of coal, fossil fuels, rock and mineral resources
- Plants of the forest
- Range and pasture
- Soils for agriculture and food
- Water resources that include sea, oceans, lakes, groundwater, rivers and fishery
- Solar power from the sun

## **Problems Associated with Natural Resources**

### **1. The Unequal Consumption of Natural Resources**

One of the major issues faced by the world today in terms of natural resources is that the technologically advanced or the developed world usually known as 'the West' consumes a major part of the natural resources. India and China of 'the East' which comes under the 'developing' nations also overuse many resources due to their overpopulation. However, the per capita (per individual) consumption of resources of the developed countries is up to 50 times greater than in most developing countries. Moreover, advanced countries produce over 75% of global industrial waste and greenhouse gases.

### **2. Planning Land Use**

Land is a major resource, needed not only for food production and animal husbandry, but also for industry and for growing human settlements. These forms of intensive land use are frequently extended at the cost of 'wild lands', our remaining forests, grasslands, wetlands and deserts. This demands for a pragmatic policy that analyses the land allocation for different uses.

### **3. The Need for Sustainable Lifestyles**

Human standard of living and the health of the ecosystem are indicators of sustainable use of resources in any country or region. Ironically, both are not in concurrence with each other.



Increasing the level of one, usually leads to degradation of other. Development policies should be formulated to strike a balance between the two.

### **Factors Influencing Resource Availability, Distribution and Uses**

Not all areas of the world have the same natural resources. Some regions may enjoy fertile soils or plenty of vegetation while others have abundant precious stones. This uneven distribution has led to trade. One area can buy a resource scarce to them that is abundant somewhere else. Sometimes, the location of resources is a matter of conflict, as one group tries to take ownership of a given resource already under the control of someone else. The distribution of fertile soils is a determinant for agriculture. Worldwide, the best soils are in the southern part of Russia, in the South American pampas, and in the American prairies in the US. These regions are home to intensive agricultural activities. Regions of Southeast Asia, southern China, South America, and Sub Saharan Africa also have productive soils.

Enormous reserves of oil are located in the Middle East, especially in Saudi Arabia, Iraq, and Iran. Venezuela, in South America, also holds huge amounts of oil. In the Chaptered States, most oil and gas are located in Texas and along the Gulf Coast. Russia has the largest reserves of natural gas and is also the largest producer. Iran and Qatar have plenty of gas, but the Chaptered States is the second producer of gas (although it has only one fifth of Russia's reserves). Countries rich in precious metals include Australia and South Africa, which has abundant diamonds. China, Russia, Chaptered States, Canada, and Peru are the largest gold producers. Fresh water is becoming more and more valuable. The Amazon Basin, especially Brazil and Colombia, are home to the largest amounts of fresh water, followed by North America. On the other side of the world, Russia and China both have large reserves as well. There are plenty of other natural resources and they are distributed irregularly, causing some nations to be large producers and others to be dependent on imports.

### **Interrelationships among Different Types of Natural Resources**

Natural resources are naturally occurring substances. It is considered as valuable in their natural form. Generally, they are classified as renewable and non-renewable resources. Renewable natural resources (RNRs) are generally living resources (i.e. fauna and flora) but also includes soil, water, wind, tides, and solar radiation. Non-renewable resources can be extracted from nature but are not replaced, such as minerals and petroleum. RNRs are available in the form of forestry, inland and marine fisheries, wildlife, and grazing, land and water resources. Major debates encircle the levels and nature of governance for natural resources. Their major focus is on three institutional arenas namely the state, the civil society and markets. These debates are focused on the effectiveness and appropriateness of each arena for delivering economic objectives, from natural resource conservation to equitable economic development and poverty reduction.

#### **To Do Activity**

Take a simple object in daily use and track its components back to each of its spheres. E.g., this textbook

1. paper from wood – biosphere
2. Water for pulping – hydrosphere
3. Bleach to whiten paper – a mineral from lithosphere

## 1.2 Natural Resources Management

Natural Resources Management is essential not only for the existence of the present generation but also for the sustenance of the future. It is a scientific approach for the utilization and conservation of land, water bodies, soil systems, plants and animals to enable people to fulfil the requirement so that along with the present generation the future generations would also be benefited. Therefore, the management of natural resources is combination of scientific and technical understanding of the same.

### Ecological, Social and Economic Dimensions of Resource Management

Natural resources occur freely in nature and hence its conservation and management are at the discretion of the people. People's values, behaviour and decisions play a major role in the management of natural resources and so it can be considered as social processes. Human individuals relate to nature through social relations established with others, which in turn shapes their perceptions, values, knowledge, power, Opportunity Unities and decisions. The success or failure of conservation and management of resources depends largely on people's behaviour and decisions towards nature. Successful management of resources can be judged by the degree to which it contributes to the wellbeing of people and their environment. In this context, the social, cultural, economic, and political factors in the conservation and management of natural resources are to be taken into consideration. Various factors that contribute to this cause include peoples' values, attitudes, beliefs, behaviours, both individually and collectively, the ways people value and use natural resources and the social, economic, and political organization of resource use. Therefore, it is important to consider people's perceptions, attitudes, expectations, and behaviour and the social and economic impacts of conservation and management of natural resources. Considering all these factors, some of the relevant questions to be considered in this regard include

- What is the nature and extent of the activity in and near the conserved area?
- Do the locals or indigenous people support or oppose the conserved area? Why or why not?
- What social and economic effects might be expected from establishing protected or conserved area? How are these effects distributed? Are there alternative sites or designs that might lessen the negative effects or increase the positive effects on resource users?
- How might the nature and extent of activity change with the conservation goal? Is there a concentration of much activity at the area reserved?
- How would these changes affect resource conditions and outcomes in ecological, social, and economic terms within and outside the conserved area?

The understanding of all aspects of conservation of natural resources is essential in minimizing the negative effects of conservation. On the other hand, the provision of right information on conservation maximizes their positive effects on resources conservation. Failure to consider them can lead to the failure of resources conservation to achieve their ecological, social, and economic goals.

In order to achieve the goals of conservation, there should be open dialogue and negotiation among different stakeholders within global, regional, national and local contexts. This will lead to more equitable sharing of the costs and benefits of conservation. Policy issues at the national and global level, such as international trade agreements, global conventions and treaties, shape decisions affecting the use of natural resources and ecosystems, and therefore affect social stability and human security. There is a need for environmental laws, regulations, policies and practices that contribute to

more equitable sharing of the cost and benefits of conservation, and more even distribution of entitlements of natural resources. Capacity building at the local and national level is essential to support democratic participation of local people within policy development, in order to reach more equitable power sharing between poor and rich countries.

The concept of social equity in conservation is important as it aims at fair distribution of the benefits and costs of conservation among different social groups and individuals. It acknowledges that social groups and individuals have differential needs, interests, rights and responsibilities over resources, and that the impacts of conservation are experienced differently by these groups. Unless special provisions are made to balance differences in tenure, power, knowledge and decisions, conservation and sustainable use initiatives are going to perpetuate and sharpen social and economic differentiation. By doing so, they would fail to build a solid social base for sustainability and socioenvironmental security. Broad participation of stakeholders without gender, class, age, ethnicity, religion, culture or racial discrimination is required within natural resources management, in order to ensure their integrity and human development. Social equity is not only the keystone of long term social stability and security, which are essential aspects of human welfare and sustainable development, but it is also a fundamental condition for sustainable use of natural resources.

According to The International Union of Conservation of nature (IUCN), effective programs that promote sustainable and equitable conservation and natural resources management must fully embrace socioeconomic and cultural equity concerns in its policies, programs and projects at the local, national, regional and global level. IUCN's mission has identified six major areas where issues of social equity in resources conservation need to be explicitly addressed. These are

- Social Diversity and Equity
- Gender and Equity
- Tenure and Participatory Management
- Indigenous and Traditional Peoples
- Security and Equity
- Poverty

To achieve conservation of natural resources, it is important that fair access and control to natural resources must be available to local people, without discrimination based on gender, class, ethnicity, age or other social variables. Empowerment of comm Charteris and local users and recognition of their rights and responsibilities help in achieving this goal. Means to sustainable livelihoods and human development must be ensured. Fair and safe tenure systems for land and natural resources increases social stability and local resources users' incentives and abilities to participate in resource management decisions in effective ways. Very often indigenous and traditional peoples have been unfairly affected by conservation policies and practices. It is because conservation policies and practices often fail to understand the rights and roles of indigenous peoples in the management, use and conservation of biodiversity. In line with numerous international agreements (e.g., Agenda 21; ILO convention no. 169; Article 8(j) of the CBD; and the draft UN Declaration on the Rights of Indigenous Peoples) several IUCN WCC resolutions emphasize indigenous people's rights to lands and territories, and natural resources on which they have traditionally subsisted. These resolutions stress the need to enhance participation of indigenous peoples in all conservation initiatives and policy developments that affect them. Moreover, it is recognised that indigenous peoples possess a unique body of knowledge related to the conservation and use of natural resources. These include

- Respect indigenous people's knowledge and innovations, and their social, cultural, religious and spiritual values and practices.
- Recognize the social, economic and cultural rights of indigenous peoples such as their right to lands and territories and natural resources, respecting their social and cultural identity, their customs, traditions and institutions.
- Ensure full and just participation of indigenous peoples in all conservation activities supported and implemented by IUCN.
- Support indigenous peoples' right to make their own decisions affecting their lands, territories and resources, by assuring their rights to manage natural resources, such as wildlife, on which their livelihoods and ways of life depend, provided they make sustainable use of natural resources.
- Strengthen the rights and full and equal participation of traditional institutions and strengthen the capacity of indigenous people to ensure that they benefit from any utilization of their knowledge.

Social equity is regarded as the cornerstone of long term environmental and human security. It is also a prerequisite of sustainable conservation of nature and management of natural resources. The surging demand for natural resources due to inequitable consumption and distribution of resources and global economic development patterns leads to unsustainable environmental practices. These global mechanisms exacerbate the demographic pressure on natural resources exerted by communities and individuals whose livelihoods rely more directly on natural resources. The same patterns of behaviour that increase high standards of wasteful consumption in the developed countries leads to an increase in resource scarcity, conflicts and poverty in developing countries. Often, we see the poorest people and communities at the receiving end who are affected by this disproportionate appropriation and consumption of resources and by environmental degradation.

Globalization has great impact on local and national economies and societies, and it has affected people's lives and use of natural resources. Various factors that directly affect natural resources and indirectly on the long term security of humans on global scale include expansion of markets, communication, western consumption patterns, homogenization and modernization of culture and lifestyles, increasing pressure on natural resources, and sharpened differences between rich and the poor. Interdependencies among stakeholders have increased which makes environmental and social issues a common urgent agenda for all people around the world since it leaves no conserved place on the earth. In order to ensure conservation of resources it is essential to raise awareness, increase networking and to build institutional capacity to hasten this process. The aim is to secure healthy ecosystems in terms of natural resources conservation and to build strong democratic and fair civil society throughout the world.

Various factors including political and social causes adversely affect the conservation of resources. Political and social disruptions like war, crime and corruption divert resources from areas of greatest human need, damage the capacity of societies to plan for resources conservation and management, and generally threaten human wellbeing and the environment. Depletion of natural resources including fresh water increases the likelihood of "resource wars". This aspect of resources conservation is referred to as environmental security. This leads to a clear need for global environmental agreements to manage resources such as aquifers and rivers which span political boundaries, and to protect global systems including oceans and the atmosphere.

One of the important aspects in environmental resource management is sustainability. It involves managing economic, social, and ecological systems both within and outside an organizational entity so that it can sustain itself and the system it exists in. In context, sustainability implies that rather than competing for endless growth on a finite planet, development improves quality of life without necessarily consuming more resources. Management of environmental resources in a sustainable manner requires organizational changes that instils sustainability values. These values should be presented outwardly from all levels and reinforces them to surrounding stakeholders. This results in a symbiotic relationship between the sustaining organization, community, and environment. Many drivers compel environmental resource management to take sustainability issues into account.

### **Economical**

The economy functions within and is dependent upon goods and services provided by natural ecosystems. Both classical economics and neoclassical economic theories recognizes the role of environment. Since the policy makers emphasise solely on economic growth, economic policies from 1950 to 1980 had neglected environment issues and was given a low priority. With the prevalence of environmental problems, many economists embraced the notion that, "If environmental sustainability must coexist for economic sustainability, then the overall system must permit identification of an equilibrium between the environment and the economy." As such, economic policy makers began to incorporate the functions of the natural environment—or natural capital — particularly as a sink for wastes and for the provision of raw materials and amenities.

Economists now continue to debate as to how to account for natural capital, specifically whether knowledge and technology can act as an alternative for technology or whether the environment is a closed system that cannot be replenished and is finite. Today's economic paradigms do not protect the natural environment, yet they intensify human dependency on biodiversity and ecosystem services.

### **Ecological**

Many environmental resource managers lament that there exists a significant uncertainty about the behaviour and response of ecological systems and there is an urgency for near term action. Ecologically this leads to severe environmental degradation and climate change which might eventually threaten the stability of the very ecological systems which acts as the foundation of humanity.

### **Social**

Environmental degradation is highly aggravated by a variety of social factors which includes an increasing gap between rich and poor. The global North South divide further deepens the situation by denying masses access to basic human needs, rights, and education. Our earth's unstable condition is due to by many anthropogenic sources. In order to demonstrate effective outcomes and to arrest this global scenario of environmental degradation, the modern organisation has the potential to apply environmental resource management with sustainability principles that can act as a powerful contributing factor.

### **Approaches to Natural Resource Management**

Natural resource management is generally considered as the management of natural resources which includes land, water, soil, plants and animals. It focuses on how management affects the quality of life for both the present and future generations. Natural resource management looks at ways of

interaction between people and natural landscapes and tries to manage it to the optimum levels. It brings together land use planning, water management, biodiversity conservation, and the future sustainability of industries like agriculture, mining, tourism, fisheries and forestry. Natural resource management recognises that people and their livelihoods depend on the health and productivity of our landscapes. It believes that in order to maintain the health and productivity of our landscapes people play a critical role as stewards of our land.

Natural resource management specifically focuses on scientific and technical understanding of resources and ecology and the life supporting capacity of those resources. Environmental management functions like natural resource management. There are various approaches for natural resources management and some of them are discussed below.

### **Community Based Natural Resource Management**

The Community Based Natural Resource Management (CBNRM) approach integrates the objectives of conservation with the generation of economic benefits for rural. The three key assumptions behind this approach are (a) local communities are better placed to conserve natural resources (b) people will conserve a resource only if the benefits accrued exceed the costs of conservation and (c) people will conserve a resource if it is directly linked to their quality of life. If conservation enhances the quality of life of locals, their commitment and efforts to ensure the future wellbeing of the resources are also enhanced. Regional and community based natural resource management is also based on the principle of subsidiarity.

### **Adaptive Management**

Adaptive management is the primary methodological approach adopted by catchment management authorities (CMAs) for regional natural resource management in Australia. This approach recognises that adaption occurs through a process of 'plan do review act'. It also emphasises on seven key components for quality natural resource management practice. These are Determination of scale, Collection and use of knowledge, Information management, Monitoring and evaluation, Risk management, Community engagement, and Opportunities for collaboration.

### **Integrated Natural Resource Management**

Integrated natural resource management (INRM) is a process of managing natural resources in a systematic way. It includes varied aspects of natural resource use (biophysical, socio-political, and economic) that meet production goals of producers and other direct users (e.g., food security, profitability, risk aversion) as well as goals of the wider community (e.g., poverty alleviation, welfare of future generations, environmental conservation). It focuses on sustainability and tries to incorporate all possible stakeholders from the planning level itself, thus reducing possible future conflicts. The conceptual basis of INRM has evolved in recent years through the convergence of research in diverse areas such as sustainable land use, participatory planning, integrated watershed management, and adaptive management. INRM is being used extensively and has been successful in regional and community based natural management.

### **To Do Activity**

#### **Utilisation of resources**

The use of a resource begins with its collection, its processing into a useable product, and transport through a delivery system, to the consumer who uses it. It also involves disposal of the waste products produced at each step. Each step in resource use can affect the environment for better or worse. The

control of these steps is known as environmental management. Think of a resource you use and track it through these steps.

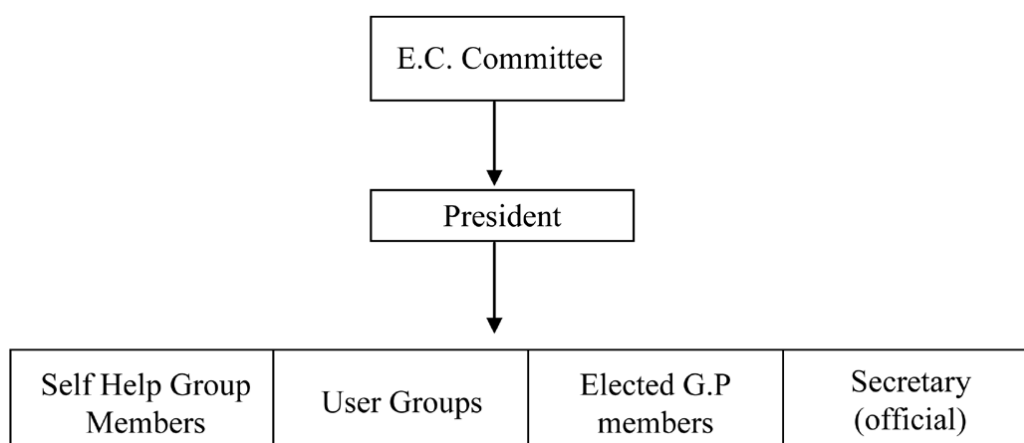
E.g. The cotton in the clothes you wear. At each step note

- What other resources are needed at this step to move the resource you chose to the next?
- What waste products are generated at that step?
- How are they likely to be disposed of?
- What pollutants are generated in the process?

### 1.3 Management of Natural Resources in India

The success of any biodiversity programme depends on the integration of indigenous communities into it. Indigenous communities are considered as the holders and carriers of traditional ecological knowledge and wisdom regarding the use and management of natural resources. In order to ensure the sustainability and cost effectiveness of biodiversity programmes, it is essential to incorporate the active participation of these communities. In other words, it is important that the prior consultation, participation, and consent procedures (communication with each other) of these communities are vital for implementing any such programmes. This is mainly because the approach of indigenous communities towards assessing the value of natural resources (both in terms of conservation and utilization) is unique as compared to the current conservation economists.

Natural resources such as land, water bodies, biodiversity and genetic resources, biomass resources, forests, livestock and fisheries—are the basic sources of human survival and prosperity. However, it is observed that they have been steadily degrading since 5000 B.C and the unprecedented pace of their erosion is the root cause for the present environmental uncertainties. Most of the problems faced by our planet namely land degradation, vegetation loss, pollution and the like are due to the overexploitation of natural resources in the context of an ever growing population. To address such issues, traditional knowledge can act as the main basis since it is a proven treasure for natural resource management. One of the major concerns in this endeavour is to rehabilitate the degraded and vulnerable lands.



**Figure 1.2 Ground Level Organizational Chart for Sustainable Development of Natural Resources**

#### Consequences of Exploitation of Natural Resources

The consequences of exploitation of natural resources are varied. Some examples are given below Burning of fossil fuels creates air pollution. Excess amount of carbon dioxide in the atmosphere leads



to global warming. Some polluting gases like oxides of nitrogen and sulphur lead to acid rain, which is harmful for living beings. Acid rain adversely affects monuments and buildings. Excess exploitation of groundwater leads to a drastic fall in water table which results in acute shortage of drinking water in many areas. Overuse of fertilisers and insecticides leads to soil pollution and soil erosion. Many pollutants are directly flown into water bodies. This has resulted in water pollution in many rivers, lakes and even in oceans.

### **Sustainable Development**

Development is vital for making all round economic development. But development often comes at a price and is often linked to environmental damage. Sustainable development ensures safety of our environment by following certain practices. This is essential for maintaining our planet in a good condition so that future generations can also enjoy the bounty of nature.

### **Three Rs (Reduce, Recycle and Reuse)**

**Reduce** We should reduce the consumption of natural resources wherever possible. For example, we can reduce the consumption of electricity by switching off lights and other appliances when they are not in use. While leaving the home, one should always check for fans and lights and switch them off. This can not only help in saving electricity but also in saving the fuels which are utilised in electricity production. We should immediately repair a leaking tap so that precious water can be saved.

**Recycle** There are many items which can be recycled again and again. Recycling is another way of reducing the demand for natural resources. For example, by recycling paper, we reduce the demand for wood and thus help in saving the forest.

**Reuse** Many items can be reused many times. For example, old newspapers can be used for packing many items.

### **National Policy on Conservation of Resources**

There is a growing consciousness of environment conservation today and for a developing country like India efficient use of resources is of utmost importance. Our R & D (Research and Development) efforts must be enhanced to explore new resources, devise technologies to minimize waste and conserve non-renewable resources. Government of India has formulated several policies and programmes for the conservation of our biotic & abiotic resources.

1. A Ministry of Forests and Environment was created at the Union level in 1980 to give high priority to issues relating to forest and environment in the country. Currently, all state governments have created independent Ministry of Forest and Environment.
2. National Forest Policy of 1950 was revised in 1988 aiming at protection, conservation and development of forests in the country. Under this policy Social Forestry Scheme was launched to increase green coverage, produce and supply of fuel wood etc.
3. National Land Use and Conservation Boards were established in 1983 and restructured in 1985 for land resource conservation and preparation of perspective plan for optimum utilization of land resources.
4. National Water Policy was adopted in 1987 which accord the highest priority to drinking water, followed by irrigational hydel power generation, navigational, industrial and other uses of water.



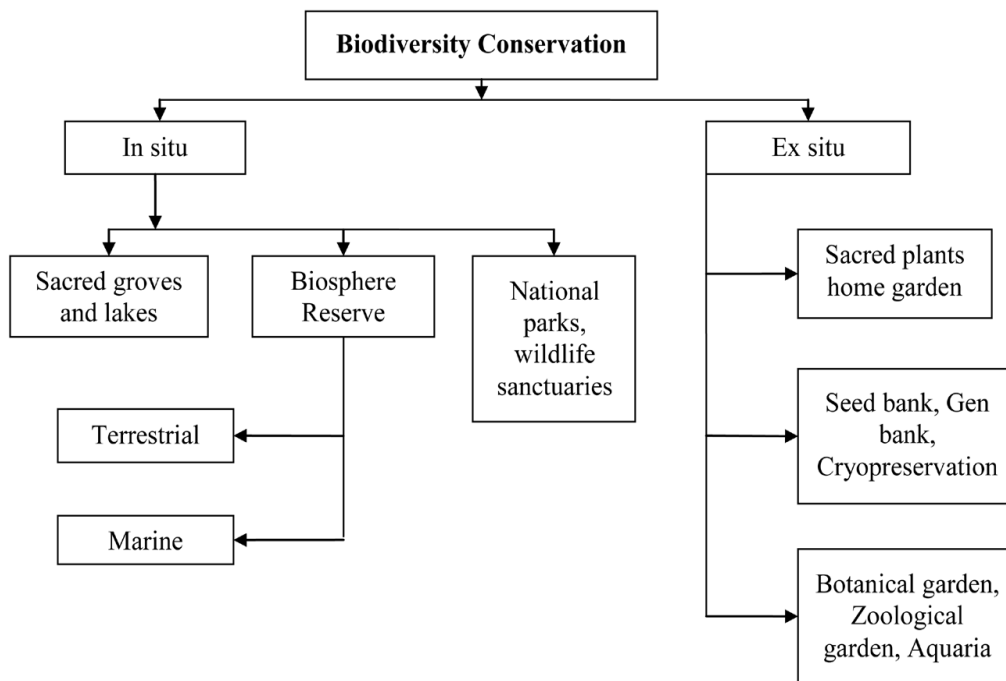
5. A National Mineral Policy framed in 1990 has allowed both domestic and foreign enterprises to invest in mineral extraction and export. It also allowed the authorities to permit investment in mineral extraction directly under the Union Ministry of Mines.
6. In the new agriculture policy of govt of India, encouragement is given to the use of eco-friendly and sustainable agricultural technology, i.e. biotechnology.

### **The Need Integrated Natural Resource Management Policy**

There is an imminent danger awaiting our planet in terms of natural resources. To overcome this threat, the best way forward is to consider natural resources as one integral piece of asset on our earth. All our natural resources including land, water, air, forest and minerals should be governed by uniform use policy. In fact, government should focus on a new set of policies with the primary goal of natural resource management with conservation and resource enhancement and preservation and pollution abatement. An integrated natural resource management policy can be a directive principle underlying the policy for states to administer with various departments and the Centre to monitor and evaluate the programmes. Umbrella legislation like the well drafted EPA (Environmental Protection Act) 1986, can go a long way in making a thematic conservation strategy for resource utilization and regeneration possible. Any policy should keep people as its prime focus.

Any programmes aimed at management of resources and conservation of world's natural resources can occur with the effective participation of people. In order to achieve this goal, people should be given incentives which encourages them to reforms their behaviour and rethinks their decisions towards the environment. This will help in preventing the largescale destruction of the nations and the world's natural resources. The failure to view natural resources and the environment as one whole entity can have far reaching adverse consequences. Ecology entails an interrelated existence of living beings and natural resources with environmental justice as the touching stone of resource conservation. Considering that resource conservation is a necessary condition for ensuring environmental justice, reorienting the legal regime towards this goal becomes significant in terms of policy and effects.

The interlinkage between water (jal), soil (jameen) and forest (jungle) requires a long term plan for developing forests, stopping the expansion of deserts, conserving soil fertility and nurturing groundwater through rainwater harvesting, especially for meeting the challenges of droughts. The present disintegrated approaches and standards adopted by different statutory bodies comes with loopholes so that different entities accuse each other of violations and escape their accountability. Integrated approaches and definitive standards are the need of the hour so that everyone is held responsible for the violation of policies. Unless conservation and preservation become the main aim of policymaking, environment in general and resources in particular face a possible threat of extinction.



**Figure 1.3 Approaches for Biodiversity Conservation**

## 1.4 Forest Resources

### Forest Resources

Forests are an important renewable resource. Forests are diverse in composition and this diversity can contribute substantially to the economic development of any country. Plants along with trees cover large areas, produce variety of products and provide food for living organisms, and are also important to save the environment. It is estimated that about 30% of world area is covered by forests whereas 26% by pastures. Among all continents, Africa has the largest forested area (33%) followed by Latin America (25%), whereas in North America forest cover is only 11%. Asia and former USSR has 14% area under forest. European countries have only 3% area under forest cover. India's forest cover accounts for 20.6% of the total geographical area of the country as of 2005.

### Contribution of Forests as a Resource

Forests can provide prosperity to human beings and to the nations. Important uses of forests can be classified as follows

- Commercial values
- Ecological significance
- Aesthetic values
- Life and economy of tribal people

### Commercial Values

Forests are main source of many commercial products such as wood, timber, pulpwood etc. About 1.5 billion people depend upon fuel wood as an energy source. Timber obtained from the forest can used to make plywood, board, doors and windows, furniture, and agriculture implements and sports goods. Timber is also a raw material for preparation of paper, rayon and film. Forests can provide food, fibre, edible oils and drugs. Forest lands are also used for agriculture and grazing. Forests is an important source of development of dams, recreation and mining.

### **Life and Economy of Tribal People**

Forests provide food, medicine and other products needed for tribal people and play a vital role in the life and economy of tribal living in the forest.

### **Ecological Uses**

Forests are habitat to all wild animals, plants and support millions of species. They help in reducing global warming caused by greenhouse gases and produces oxygen during photosynthesis. Forests can act as pollution purifiers by absorbing toxic gases. Forests not only help in soil conservation but also help to regulate the hydrological cycle.

### **Aesthetic Values**

All over the world people appreciate the beauty and tranquillity of the forests because forests have a great aesthetic value. Forests provide opportunity for recreation and ecosystem research.

### **Functions of Forest**

#### **Watershed Protection**

- Reduce the rate of surface runoff of water.
- Prevent flash floods and soil erosion.
- Produces prolonged gradual runoff of water and thus prevent effects of drought.

#### **Atmospheric Regulation**

- Absorption of solar heat during evapotranspiration.
- Maintaining carbon dioxide levels for plant growth.
- Maintaining the local climatic conditions.

#### **Erosion Control**

Holding soil (by preventing rain from directly washing soil away).

#### **Land Bank**

Maintenance of soil nutrients and structure.

**Local Use Consumption** of forest produce by local people who collect it for subsistence (Consumptive use)

- Food gathering plants, fishing, hunting from the forest. (In the past when wildlife was plentiful, people could hunt and kill animals for food. Now that population of most wildlife species have diminished, continued hunting would lead to extinction.)
- Fodder for cattle.
- Fuel wood and charcoal for cooking, heating.
- Poles building homes especially in rural and wilderness areas.
- Timber – household articles and construction.
- Fibre weaving of baskets, ropes, nets, strings, etc.
- Sericulture – for silk.
- Apiculture bees for honey, forest bees also pollinate crops.
- Medicinal plants traditionally used medicines, investigating them as potential source for new modern drugs.

### **Market Use (Productive use)**

- Most of the above products used for consumptive purposes are also sold as a source of income for supporting the livelihoods of forest dwelling people.
- Minor forest produce (non-wood products) Fuel wood, fruit, gum, fibre, etc. which are collected and sold in local markets as a source of income for forest dwellers.
- Major timber extraction construction, industrial uses, paper pulp, etc. Timber extraction is done in India by the Forest Department, but illegal logging continues in many forests of India and the world.

### **Use and Over Exploitation**

India has about 12 percent of its land under forests according to the latest reports. The research and survey suggest that India should ideally have 33 percent of its land under forests. Thus, there is a greater need to protect existing forests and to increase our forest cover.

People who live in the forests or near it have firsthand knowledge of the value of forest resources. They depend on forests for their livelihoods. On the other hand, we all depend on forests for many things and derive great benefits from the forests which we are rarely aware of. We depend on forests for one of the most essential need in our life which is water. The availability of water depends on the existence of forests on the watersheds around river valleys. We use wood from forests to construct our homes, furniture etc. The papers we use also use wood from forests. Much of the medicines we use are based on forest produce. Forests provide us with plenty of oxygen and remove the carbon dioxide we exhale. Forests once extended over large tracts of our country and people have used it for thousands of years. With the advancement of agriculture, the tribal people began controlling the forests and it became scanty. Tribal lifestyle was solely dependent on forest resources; they hunted animals for food and gathered plants. Later when Britishers ruled India, deforestation was a major concern as large amounts of timber was extracted for building their ships. This led the British to develop scientific forestry in India. It was during this period that Reserved and Protected Forests were created and they alienated tribal people and curtailed their access to the resources. This led to a loss of stake in the conservation of the forests which ultimately led to a gradual degradation and fragmentation of forests across the length and breadth of the country. Later after independence, once the Britishers left our country, the local people began exploiting forests which further led to overutilization and degradation of forests.

### **Deforestation**

History reveals that whenever civilizations have cautiously used forest resources and taken care of forests, they have prospered and wherever they destroyed forests people were gradually impoverished. Around the world logging and mining are one of the major causes of loss of forests. Dams built for hydroelectric power or irrigation have submerged forests and have displaced tribal people whose lives are closely knit to the forests. This has become a serious cause of concern in India.

One of India's serious environmental problems is forest degradation due to timber extraction. We depend on forests for fuel wood. Our rural folk still depends largely on wood to cook their meals and heat their homes. We have not been able to plant enough trees to support the need for timber and fuel wood. The National Forest Policy of 1988 now gives an added importance to Joint Forest Management (JFM). A resolution passed in 1990 provided a formal structure for community participation through the formation of Village Forest Committees. Based on these experiences, new

JFM guidelines were issued in 2000. This stipulates that at least 25 per cent of the income from the area must go to the community. From the initiation of the program, until 2002, there were 63,618 JFM Committees managing over 140,953 sq. km of forest under JFM in 27 States in India.

The States have tried a variety of approaches to JFM. The share for village forest committees ranges from 25 per cent in Kerala to 100 per cent in Andhra Pradesh, 50 per cent in Gujarat, Maharashtra, Orissa and Tripura. In many States 25 per cent of the revenue is used for village development. In many States non timber forest products (NTFPs) are available for people free of cost.

Some States have stopped grazing completely; some have rotational grazing schemes which have helped in forest regeneration.

### **Causes of Deforestation**

Reports reveal that there is an increase in forest area in some developed nations. However, in developing countries, especially in tropical region, there is a decline in forest area. Some of the main causes of deforestation are

a. Shifting cultivation or jhum cultivation

This practise is prevalent in tribal areas where forest lands are cleared to grow subsistence crops. It is estimated that shifting cultivation is the principle cause of deforestation in tropics in Africa, Asia and tropical America and is estimated to be 70%, 50%, and 35% respectively. Shifting cultivation is a practice of slash and burn forest land for cultivation and it clears more than 5 lakh hectares of land annually. In India, shifting cultivation is prevalent in northeast and to a limited extent in M.P, Bihar and Andhra Pradesh and is one of the significant contributors to deforestation.

b. Commercial logging

It is an important deforestation agent. It may not be the primary cause, but it acts as secondary cause. It is because new logging lots permits shifting cultivation and fuel wood gatherers access to new logged areas.

c. Need for fuel wood

India's ever increasing population has led to increased demand for fuel wood, which is also acting as an important deforestation agent, particularly in dry forest.

d. Expansion for agribusiness

With the addition of cash crops such as oil palm, rubber, fruits and ornamental plants, there is a demand for land for agribusiness products which results in deforestation.

e. Development projects and growing need for food

The growing demand for electricity, irrigation, construction, mining, etc. has led to destruction of forests. Increased population requires more food which demands more agricultural crops which needs more land thus leading to deforestation.

f. Raw materials for industrial use

Forests provides raw materials for industry and it has exerted tremendous pressure on forests. Increasing demand for plywood for packing has exerted pressure on cutting of some species of trees such as fir to be used as packing material for apple in J&K and tea in northeaster states.

### **Major Effects of Deforestation**

Deforestation adversely and directly affects and damages the environment and living beings. Major causes of deforestation are

- Soil erosion and loss of soil fertility
- Decrease of rainfall due to its effect on hydrological cycle
- Expansion of deserts
- Climate change and depletion of water table
- Loss of biodiversity, flora and fauna
- Environmental changes and disturbances in forest ecosystems

### **Timber Extraction, Mining, Dams and their Effects on Forest and Tribal People**

Timber extraction, mining and dams are inevitable for the survival of a developing country. If timber is overharvested the forests lose its ecological functions. Forests are areas where there are rich mineral resources. Forests also cover the steep embankments of river valleys, which are ideally suited to develop hydel and irrigation projects. Thus, there is a constant conflict of interests between the conservation interests of environmental scientists and the Mining and Irrigation Departments. What needs to be understood is that longterm ecological gains cannot be sacrificed for short term economic gains that lead to deforestation. The execution of various development projects in forests can also lead to the displacement of thousands of tribal people.

#### **Timber Extraction**

There has been unlimited exploitation of timber for commercial use. Due to increased industrial demand, timber extraction has significant effect on forests and tribal people.

#### **Logging**

Poor logging results in degraded forests and may lead to soil erosion especially on slopes. As the permits for logging increases, it leads to new roads to these logging areas which allow shifting cultivators and fuel wood gatherers to gain access to the logging area. It may result in

- Loss of long-term forest productivity
- Elimination of a variety of species of plants and animals
- Exploitation of tribal people

#### **Mining**

Mining is one of the major causes of deforestation in India. It adversely affects both the forests and the tribal people. Major effects of mining on forests and tribal people are

- Mining from shallow deposits is done by surface mining while that from deep deposits is done by subsurface mining. It leads to degradation of lands and loss of topsoil. It is estimated that about eighty thousand hectares of land is under stress of mining activities in India.
- Mining leads to drying up of perennial sources of water like springs and streams in mountainous areas.
- Mining and other associated activities remove vegetation along with underlying soil mantle, which results in destruction of topography and landscape in the area.

Large scale deforestation has been reported in Mussorie and Dehradun valley due to indiscriminate mining. It is estimated that the forested area has declined at an average rate of 33% and the resultant increase in non forest area has resulted in relatively unstable zones leading to landslides.

Indiscriminate mining in forests of Goa since 1961 has destroyed more than 50000 hectares of forest land. Coal mining in Jharia, Raniganj and Singrauli areas has caused extensive deforestation in Jharkhand.

Mining of magnetite and soapstone have destroyed 14 hectares of forest in hilly slopes of Khirakot, Kosi valley and Almora. Mining of radioactive minerals in Kerala, Tamilnadu and Karnataka are posing similar threats of deforestation. The rich forests of Western Ghats are also facing the same threat due to mining projects for excavation of copper, chromite, bauxite and magnetite.

### **Effects of Dams on Forests and Tribal People**

Pandit Jawaharlal Nehru referred dam and valley projects as “Temples of modern India”. Though these big dams and river valley projects have multipurpose uses they are also the causes for the destruction of forests. They are responsible for degradation of catchment areas, loss of flora and fauna, increase of water borne diseases, disturbance in forest ecosystems, rehabilitation and resettlement of tribal peoples. India has more than 1550 large dams, the maximum being in the state of Maharashtra (more than 600), followed by Gujarat (more than 250) and Madhya Pradesh (130). The highest one is Tehri dam, on river Bhagirathi in Uttaranchal and the largest in terms of capacity is Bhakra dam on river Satluj in Himachal Pradesh. Big dams have been in sharp focus of various environmental groups all over the world, which is mainly because of several ecological problems including deforestation and socioeconomic problems related to tribal or native people associated with them. The Silent valley hydroelectric project was one of the first such projects situated in the tropical rain forest area of Western Ghats which attracted much concern of the people.

The crusade against the ecological damage and deforestation caused due to Tehri dam was led by Shri. Sunder Lal Bahaguna, the leader of Chipko Movement. The cause of Sardar Sarovar Dam related issues have been taken up by the environmental activist Medha Patkar, joined by Arundhati Roy and Baba Amte. For building big dams, large scale destruction of forests takes place which breaks the natural ecological balance of the region. Floods, droughts and landslides become more prevalent in such areas. Forests are the repositories of invaluable gifts of nature in the form of biodiversity and by destroying them (particularly, the tropical rain forests), we are going to lose these species even before knowing them. These species could be having marvellous economic or medicinal value and deforestation results in loss of this storehouse of species which have evolved over millions of years in a single stroke.

### **Case Study**

#### **Joint Forest Management**

The need to include local communities in Forest Management has become a growing concern. Local people will only support greening an area if they can see some economic benefit from conservation. An informal arrangement between local communities and the Forest Department began in 1972, in Midnapore District of West Bengal. JFM has now evolved into a formal agreement which identifies and respects the local community's rights and benefits that they need from forest resources. Under JFM schemes, Forest Protection Committees from local community members are formed. They participate in restoring green cover and protect the area from being over exploited.

## **Forest Products**

A forest product is any material obtained from forests for direct consumption or commercial use, such as lumber, paper, or forage for livestock. Wood, the dominant product of forests, is used for many purposes, such as wood fuel (e.g. in form of firewood or charcoal) or the finished structural materials used for the construction of buildings, or as a raw material, in the form of wood pulp, that is used in the production of paper. All other non-wood products derived from forest resources, comprising a broad variety of other forest products, are collectively described as non timber forest products (NTFP). Non timber forest products are viewed to have fewer negative effects on forest ecosystem when providing income sources for local community.

Non-wood products obtained from forests include food – such as berries, mushrooms, edible plants, game and bush meat – fodder, and medicinal plants. These products perform a vital role in meeting the subsistence needs of a large part of the world’s population living in or near forests and providing them with income generating opportunities. Non wood forest products are collected for local household use or trade, though some find export markets. Overall, about half of the world’s forests are designated for production of forest products (as either primary or secondary function). At the global level, 34% of total forest area has production of forest products as its main purpose.

## **Developing and Developed World Strategies for Forestry**

In Africa, there appears to be a limited progress towards sustainable forest management during the last 15 years. There are some indications that the net loss of forest area has slowed down, and that the area of forests designated for conservation of biological diversity increased slightly. However, there is a continued rapid loss of forest area in this region which is the highest among all the regions which is a cause of great concern. In Asia, forest area was almost the same in 2005 as in 1990, mainly due to large scale efforts to replant forests (afforestation), particularly in China. Though forest health deteriorated, the area affected by forest fires, pests, and diseases is still a relatively small proportion of the total forest area. The rapid decrease in area of primary forests is a cause for concern, while the increase in area designated for conservation of biological diversity and for protective functions is commendable. In Europe, the status of forest resources has essentially been stable, with the severe storms of 1999 being the main reason for the negative trend in the health and vitality of forests. The focus of forest management in Europe has moved from productive functions towards conservation of biological diversity, protection, and multiple uses.

In North and Central America, progress towards sustainable forest management was generally positive. However, the area adversely affected by insects, diseases, and other disturbances has increased. There were considerable variations among the sub-regions. In Oceania, due to non-availability of information and insufficiency of data, it is difficult to assess progress towards sustainable forest management for that region. In South America, progress towards sustainable forest management was mixed. The net loss of forest area and the rate of loss of primary forests are increasing and it is a cause for concern. However, an increasing area of forest has been designated for conservation of biological diversity and for social services. This area has shown a decrease in removals of fuel wood which may reflect a reduced demand for this product. On the other hand, there was an increase in removals of industrial round wood. The area of productive forest plantations increased and may meet a larger proportion of the demand for wood in the future.



The 2005 Global Forest Resource Assessment coordinated by the Food and Agriculture Organization (FAO) of the United Nations is the most comprehensive assessment of forests to date, in terms of content and the number of contributors. Information was collected from 229 countries and territories for three points in time 1990, 2000 and 2005. A series of variables, related to the extent, condition, uses, and values of forests and other wooded land, were analysed. It tells us that forests cover 30% of the land area of planet Earth and range from boreal and temperate forests to arid woodlands and tropical moist forests; from undisturbed primary forests to forests managed and used for a variety of purposes. The assessment also tells us that deforestation continues at an alarmingly high rate, but that the net loss of forest area is slowing down thanks to forest planting, landscape restoration, and natural expansion of forests on abandoned land. Forests are increasingly being conserved and managed for multiple uses and values and play a crucial role in climate change mitigation as well as in the conservation of biodiversity and of soil and water resources. If managed sustainably, forests also contribute significantly to local and national economies and to the wellbeing of current and future generations. Overall, progress towards sustainable forest management has been mixed. Using the thematic elements of sustainable management as an assessment framework has helped broaden the perspective and the result is a much richer review of key trends in forest resources, their functions and benefits.

#### **To Do Activity**

What are the various forest products that we use in our daily life? List out.

Examine the trees in your locality and explain how they are useful to you and in what ways.

## **1.5 Energy Resources**

### **Energy Resources**

Energy is defined by physicists as the capacity to do work. Energy is found on our planet in a variety of forms, some of which are immediately useful to do work, while others require a process of transformation.

The sun is the primary energy source in our lives. We use it directly for its warmth and through various natural processes that provide us with food, water, fuel and shelter. The sun's rays power the growth of plants, which form our food material, give off oxygen which we breathe in and take up carbon dioxide that we breathe out. Energy from the sun evaporates water from oceans, rivers and lakes, to form clouds that turn into rain. Today's fossil fuels were once the forests that grew in prehistoric times due to the energy of the sun.

Chemical energy contained in chemical compounds is released when they are broken down by animals in the presence of oxygen. In India, manual labour is still extensively used to get work done in agricultural systems, and domestic animals used to pull carts and ploughs. Electrical energy is used in several ways, powers transport, artificial lighting, agriculture and industry.

Electrical energy comes from hydel power based on the water cycle that is powered by the sun's energy that supports evaporation, or from thermal power stations powered by fossil fuels. Nuclear energy is held in the nucleus of an atom and is now harnessed to develop electrical energy. We use energy for household use, agriculture, production of industrial goods and for running transport. Modern agriculture uses chemical fertilizers, which require large amounts of energy during their manufacture. Industry uses energy to power manufacturing plants and the urban complexes that

support it. Energy demanding roads and railway lines are built to transport products from place to place and to reach raw materials in mines and forests.

No energy related technology is completely 'risk free' and unlimited demands on energy increase this risk factor many folds. All energy use creates heat and contributes to atmospheric temperature. Many forms of energy release carbon dioxide and lead to global warming. Nuclear energy plants have caused enormous losses to the environment due to the leakage of nuclear material. The inability to effectively manage and safely dispose of nuclear waste is a serious global concern.

At present almost 2 billion people worldwide have no access to electricity at all. While more people will require electrical energy, those who do have access to it continue to increase their individual requirements. In addition, a large proportion of energy from electricity is wasted during transmission as well as at the user level. It is broadly accepted that long term trends in energy use should be towards a cleaner global energy system that is less carbon intensive and less reliant on finite non-renewable energy sources. It is estimated that the currently used methods of using renewable energy and non-renewable fossil fuel sources together will be insufficient to meet foreseeable global demands for power generation beyond the next 50 to 100 years.

Thus, when we use energy wastefully, we are contributing to a major environmental disaster for our earth. We all need to become responsible energy users. An electrical light that is burning unnecessarily contributes to environmental degradation.

### **Growing Energy Needs**

Energy has always been closely linked to man's economic growth and development. Present strategies for development that have focused on rapid economic growth have used energy utilization as an index of economic development. This index, however, does not consider the long term ill effects on society of excessive energy utilisation. In 1998, the World Resources Institute found that the average American uses 24 times the energy used by an Indian.

Between 1950 and 1990, the world's energy needs increased fourfold. The world's demand for electricity has doubled over the last 22 years! The world's total primary energy consumption in 2000 was 9096 million tons of oil. A global average per capita consumption works out to be 1.5 tons of oil. Electricity is at present the fastest growing form of end use energy worldwide. By 2005 the Asia Pacific region was expected to surpass North America in energy consumption and by 2020 is expected to consume 40% more energy than North America.

For almost 200 years, coal was the primary energy source fuelling the industrial revolution in the 19th century. At the close of the 20th century, oil accounted for 39% of the world's commercial energy consumption, followed by coal (24%) and natural gas (24%), while nuclear (7%) and hydro/renewables (6%) accounted for the rest.

Among the commercial energy sources used in India, coal is a predominant source accounting for 55% of energy consumption estimated in 2001, followed by oil (31%), natural gas (8%), hydro (5%) and nuclear (1%).

In India, biomass (mainly wood and dung) accounts for almost 40% of primary energy supply. While coal continues to remain the dominant fuel for electricity generation, nuclear power has been

increasingly used since the 1970s and 1980s and the use of natural gas has increased rapidly in the 80s and 90s.

### **Renewable and Non-Renewable Energy Sources**

Energy is generally classified into three renewable energy, non-renewable energy and nuclear energy. Though nuclear energy uses small quantities of raw material (uranium) to produce energy, all three types of energy are considered as limitless. On the other hand, this classification is inaccurate because several of the renewable sources of energy can be depleted more quickly than they can be renewed if unsustainable use of energy is continued.

### **Non-renewable Energy**

Non-renewable energy resources produce energy by ignition of raw materials. The fuel is placed in a well contained area and set on fire. The heat generated turns water to steam, which moves through pipes, to turn the blades of a turbine. This converts magnetism into electricity, which we use in various appliances.

### **Non-renewable Energy Sources**

Sources of non-renewable energy consist of the mineral based hydrocarbon fuels, coal, oil and natural gas, that were formed from ancient prehistoric forests. These are called 'fossil fuels' because they are formed after plant life is fossilized. At the present rate of extraction, there is no need to worry, we have enough coal for a long time to come. Oil and gas resources however are likely to be used up within the next 50 years. When these fuels are burnt, they produce waste products such as carbon dioxide, oxides of sulphur, nitrogen, and carbon monoxide. These gases are released into the air and are a major cause of air pollution. This had led to health issues including lung problems among large number of people around the globe. They were also a threat to monuments like Taj Mahal and endangered many forests and lakes due to acid rain. Many of these gases also act as greenhouse gases letting sunlight in and trapping the heat inside. This ultimately leads to global warming, a raise in global temperature, increased drought in some areas, floods in other regions, the melting of icecaps, and a rise in sea levels, which is slowly submerging coastal belts all over the world. Warming the seas also leads to the death of sensitive organisms such as coral.

Non-renewable energy resources can further be divided into two categories, viz. Recyclable and Nonrecyclable resources

### **Recyclable Resources**

Recyclable resources are non-renewable resources which can be recycled after use. These are mainly the nonenergy mineral resources which occur in the earth's crust (e.g. ores of aluminium, copper, mercury etc.), deposits of fertilizer nutrients (e.g. phosphate rock and potassium) and minerals used in their natural state (asbestos, clay, mica etc.)

### **Nonrecyclable Resources**

These are non-renewable resources, which cannot be recycled in any way. Examples of these are fossil fuels and nuclear energy sources (e.g. uranium) which provide 90 per cent of our energy requirements.

Sources of Energy		
Conventional Energy		Non-Conventional Energy
<b>Conventional Non-renewable Energy</b> (Mostly fossil fuels found under the Ground) Examples: Coal, Oil, Natural gas etc.	<b>Conventional Renewable Energy</b> (Mostly non-fossil fuels seen above the Ground) Examples: Firewood, Cattle Dung, Farm Vegetable Wastes, Wood charcoal, etc	<ul style="list-style-type: none"> <li>● Solar Energy</li> <li>● Hydel Energy</li> <li>● Wind Energy</li> <li>● Nuclear Energy</li> <li>● Hydrogen Energy</li> <li>● Geothermal Energy</li> <li>● Biogas</li> <li>● Tidal Energy</li> <li>● Bio-fuel</li> </ul>

**Figure 1.4 Sources of Energy**

### Energy Conservation

Conventional energy sources impact nature and human society in varied ways. India needs to rapidly shift into a policy to reduce energy needs and use cleaner energy production technologies. We should also shift to the use of alternate energy and renewable energy sources. An equitable and sustainable use of this energy would bring about environmentally friendly and sustainable lifestyles. India must also minimize its dependency on imported oil. At present we are underutilizing our natural gas resources. India has a scope of developing thousands of mini dams to generate electricity. A large amount of electricity is wasted in India during transmission. India needs to enhance fuel wood plantations and proper implementation of Joint Forestry Management (JFM) has a great promise for the future.

In India energy is wasted because of the use of inefficient cooking stoves. Efficient cooking stoves or 'chulas' help the movement of air through it so that the wood is burnt more efficiently. They also have a chimney to prevent air pollution and thus reduce respiratory problems. While over 2 lakhs improved chulas have been introduced throughout the country, the number in active use is unknown as most rural people find it unusable due to several reasons. TERI in 1995 estimated that in India 95% of rural people and 60% of urban poor still depend on firewood, cattle dung and crop residue for cooking and other domestic purposes. Biomass can be converted into biogas or liquid fuels i.e. ethanol and methanol. Biogas digesters convert animal waste or agricultural residues into gas. This is 60% methane and 40% CO<sub>2</sub> generated by fermentation. The commonly used Agri waste is dung of domestic animals and rice husk, coconut shells, straw or weeds. The material left after the production of gas is used as a fertilizer. Small hydro-generation Chapters are environment friendly. They do not displace people, destroy forests or wildlife habitats or kill aquatic and terrestrial biodiversity. They can be placed in several hill streams, on canals or rivers. The generation of energy depends on flowing water due to gravity. However, this fails if the flow is seasonal. It is easy to waste energy but cheaper to save it than generate it. We can conserve energy by preventing or reducing waste of energy and by using resources more efficiently. People waste energy because government subsidises it. If the real cost was levied, people would not be able to afford to waste it carelessly.

Industry and transport are the main growing users of energy in India. There are many industries which are known for wasting most energy and they are also known for generating maximum pollution. These

include chemical industries, especially petrochemical industries, iron and steel, textiles, paper, etc. Unplanned and inefficient public transport systems, especially in cities, waste large amount of energy. Using bicycles is an excellent method to reduce the use of energy. In agriculture, irrigation pumps to lift water are the most energy intensive. They either use electricity or run on fossil fuels.

### **Case Studies**

- Indian industries use more energy than the required amount.
- Steel and energy to produce one tonne of steel, India spends 9.5 million kilocalories of energy while in Italy it is 4.3 million kilocalories and for Japan it is only 4.1 million kilocalories of energy.
- Cement industry Over 2 million kilocalories of energy are used to produce one tonne of cement in India while in Germany it is 0.82 million kilocalories and in USA it is 0.92 million kilocalories of energy.
- Vehicles Lighter materials should be used for the manufacture of cars to conserve energy. Instead of steel, aluminium, fibre glass or plastics should be used for its production. These lighter materials reduce the weight of cars by 15 % and thus increase the fuel economy by 6 to 8%.
- Refrigerators Use of advanced technologies reduced the annual energy consumption of a typical Danish 200 litre refrigerator (with no freezer) from 350 kWh (kilo Watt hour) to 90 kWh.
- Lighting an 18Watt modern, compact fluorescent lamp can replace a standard 75Watt incandescent lamp.

### **Use of Alternate Energy Sources**

There is an urgent need to develop renewable energy sources which are available and could be utilized or the energy sources which could be created and utilized. In India, the main renewable energy sources are solar, wind, hydel, waste and biomass. Biomass are resources which are agriculture related like wood, bagasse, cow dung, seeds, etc.

### **Hydel Energy**

India has a total hydro energy potential of about 1.5 lakh MW, of which only about 20% is installed. Small hydroelectric plant potential is about 15000 MW and most of it are in the northern and eastern hilly regions.

### **Wind Energy**

The wind power potential of India is about 45,000 MW out of which capacity of 8748 MW has been installed in India till 2008. India is one of the leading countries in generating the power through wind energy. Gujarat, AP, Karnataka, MP and Rajasthan are states having more than 5000 MW potential each. These potentials could be improved if the technology of putting turbines in sea is embraced. There are wind farms on sea generating as high as 160 MW of power.

### **Geothermal Energy**

Geothermal energy is thermal energy generated and stored in the Earth. Thermal energy is the energy that determines the temperature of matter. 20% of earth's geothermal energy originates from the original formation of the planet and 80% from radioactive decay of minerals. Geothermal power is cost effective, reliable, sustainable, and environmentally friendly, but has historically been limited to

areas near tectonic plate boundaries. Recent technological advances have dramatically expanded the range and size of viable resources, especially for applications such as home heating, opening a potential for widespread exploitation. Geothermal wells release greenhouse gases trapped deep within the earth, but these emissions are much lower per energy Chapter than those of fossil fuels. As a result, geothermal power has the potential to help mitigate global warming if widely deployed in place of fossil fuels.

### **Ocean Thermal Energy Conversion (OTEC)**

Ocean Thermal Energy Conversion (OTEC) uses the difference between cooler deep and warmer shallow or surface ocean waters to run a heat engine and produce useful work, usually in the form of electricity. A heat engine gives greater efficiency and power when run with a large temperature difference. In the oceans the temperature difference between surface and deep water is greatest in the tropics, although still a modest 20 to 25°C. OTEC therefore offers the greatest possibilities in the tropics. OTEC has the potential to offer global amounts of energy that are 10 to 100 times greater than other ocean energy options such as wave power.

### **Biomass Energy**

Biomass is the oldest means of energy used by humans along with solar energy. As soon as the fire was discovered, it was used widely among humans mainly for heat and light. Fire was generated using wood or leaves, which is basically a biomass. The biomass could be used to generate steam or power or used as a fuel. Power is generated using rice husk in Andhra Pradesh, while several bagasse based plants are there. India has a potential of 3500 MW from bagasse plants. Other fast growing plants could be planned over a huge area, so that it provides biomass for generating power. Organic wastes such as dead plants and animal material, animal dung, and kitchen waste can be converted by the anaerobic digestion or fermentation into a gaseous fuel called biogas. Biogas is a mixture of 65% methane (CH<sub>4</sub>) and of 35% CO<sub>2</sub> and may have small amounts of hydrogen sulphide (H<sub>2</sub>S), moisture and siloxanes. It is a renewable energy resulting from biomass. Biogas can be used as a fuel in any country for any heating purpose, such as cooking. It can also be used in anaerobic digesters where it is typically used in a gas engine to convert the energy in the gas into electricity and heat. Biogas can be compressed, much like natural gas, and used to power motor vehicles.

### **Biofuels**

India has more than 50 million hectares of wasteland, which could be utilized for cultivating fuel plants. Jatropha is one of the options which can be planted on arid lands and be used for production of biofuels.

### **Solar Energy**

India being a tropical country has the potential to use solar energy on commercial bases. According to estimates, 35 MW of power could be generated from one square kilometre. Solar energy has high potential and future for the development of our country. Initial cost is the biggest limitation which has led to the low realization of its potential. For solar energy to become one of the premium options as the source of energy, it will require lots of research, cheap technology and low capital.

**To Do Activity**

What you may throw out in your garbage today could be used as fuel for someone else. Municipal solid waste has the potential to be a large energy source. Garbage is an inexpensive energy resource. Unlike most other energy resources, someone will collect garbage, deliver it to the power plant, and even pay to get rid of it. This helps cover the cost of turning garbage into energy. Garbage is also a unique resource because we all contribute to it.

Keep a record of all the garbage that you and your family produce in a day. What proportion of it is in the form of biomass? Weigh this. How long would it take you to gather enough waste biomass to make a tankful (0.85 cu.m.) of biogas? (Remember one ton of biomass produces 85 cu.m. of biogas).

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# Chapter 2 Watershed Management

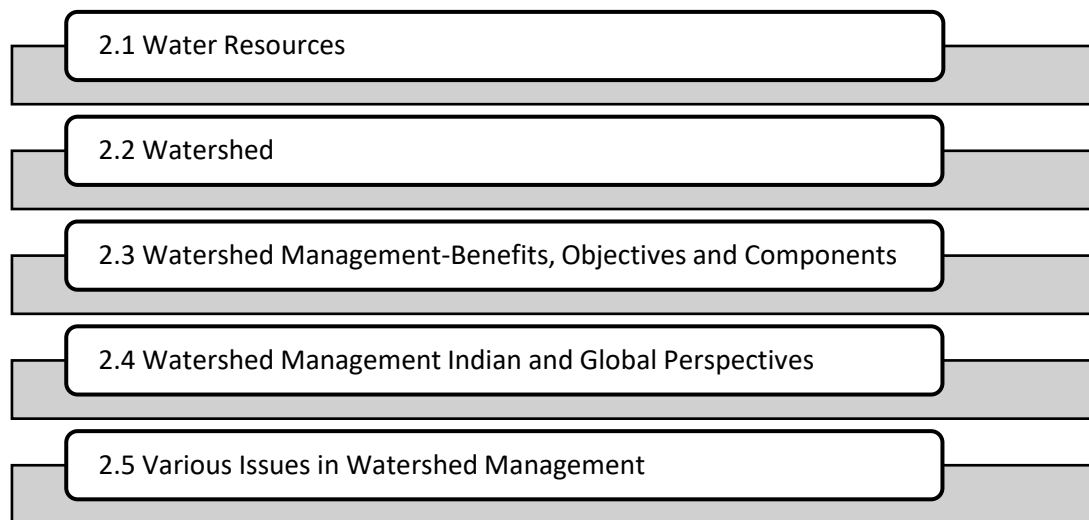
## Introduction

This Chapter focuses on Watershed management. It explains the concept of Watershed, types and characteristics of Watershed and Watershed planning and management. This Chapter also exposes water resources, types of water resources and uses of water resources.

## Objectives

- To explain about water resources, their types, and uses of water resources
- To explain the concept of Watershed, types and characteristics of Watershed
- To understand the concept of Watershed planning and management

## Structure



## 2.1 Water Resources

Water covers 71% of the earth's surface. Of this, 97.5% is the salty water of the oceans and only 2.5% is freshwater, most of which is locked up. The remaining freshwater is found in glaciers, lakes, rivers, wetlands, the soil, aquifers and atmosphere. Ocean circulation patterns have a strong influence on climate and weather and, in turn, the food supply of both humans and other organisms. From 1961 to 2001 water demand doubled, agricultural use increased by 75%, industrial use by more than 200%, and domestic use by more than 400%. In the 1990s it was estimated that humans were using 40–50% of the globally available freshwater in the approximate proportion of 70% for agriculture, 22% for industry and 8% for domestic purposes with total use progressively increasing. Life is impossible without water. It is used for manifold purposes like household purposes, irrigation, transport, for producing tidal energy etc. Water is used in many industries like textiles, iron and steel, paper etc. Tides occur due to the rise and fall of sea water which can be harnessed to produce electricity.

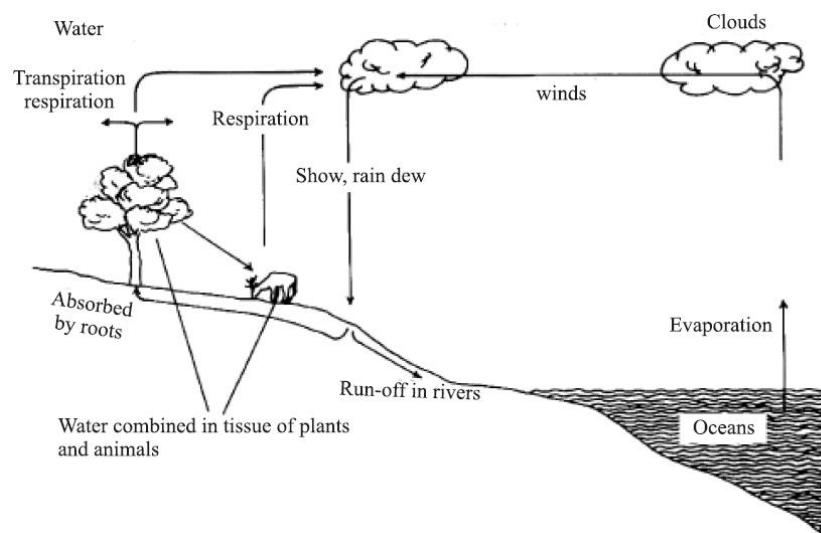
The water cycle, through evaporation and precipitation, maintains hydrological systems which form rivers and lakes and support a variety of aquatic ecosystems. Wetlands are intermediate forms between terrestrial and aquatic ecosystems and contain species of plants and animals that are highly moisture dependent. All aquatic ecosystems are used by many people for their daily needs such as



drinking, washing, cooking, watering animals, and irrigating fields. The world depends on a limited quantity of fresh water. Water covers 70% of the earth's surface but only 3% of this is fresh water. Of this, 2% is in polar ice caps and only 1% is usable water in rivers, lakes and subsoil aquifers. Only a fraction of this can be actually used. At a global level 70% of water is used for agriculture, about 25% for industry and only 5% for domestic use. However, this varies in different countries and industrialized countries use a greater percentage of water for industry. India uses 90% of water for agriculture, 7% for industry and 3% for domestic use.

One of the greatest challenges facing the world in this century is the need to rethink the strategies of overall management of water resources. The world population has crossed the 6 billion mark. Based on the proportion of young people in developing countries, this will continue to increase significantly during the next few decades. This places enormous demands on the world's limited freshwater supply. The total annual freshwater withdrawals today are estimated at 3800 cubic kilometres, twice as much as just 50 years ago (World Commission on Dams, 2000). Studies indicate that a person needs a minimum of 20 to 40 litres of water per day for drinking and sanitation. More than one billion people worldwide have no access to clean water, and in many areas' supplies are unreliable. Local conflicts are already spreading to states. E.g. Karnataka and Tamil Nadu over the waters of Krishna.

India is expected to face critical levels of water stress by 2025. At the global level 31 countries are already short of water and by 2025 there will be 48 countries facing serious water shortages. The UN has estimated that by the year 2050, 4 billion people will be seriously affected by water shortages. This will lead to multiple conflicts between countries over the sharing of water. Around 20 major cities in India face acute water shortages. There are 100 countries that share the waters of 13 large rivers and lakes. The upstream countries could starve the downstream nation's leading to political unstable areas across the world. Examples are Ethiopia, which is upstream on the Nile and Egypt, which is downstream and highly dependent on the Nile. International accords that will look at a fair distribution of water in such areas will become critical to world peace. India and Bangladesh already have a negotiated agreement on the water use of the Ganges.



**Figure 2.1 Hydrological Cycle**

## Classification and Characteristics of Water Resources

Water sources can be classified into protected or unprotected water sources. Protected sources are covered by stonework, concrete or other materials that prevent the entry of physical, chemical and biological contaminants. Typical characteristics of a protected water source are given below.

### Characteristics of a Protected Water Source

The water source is fully enclosed or capped and no surface water can run directly into it. People do not step into the water while collecting it. Latrines, solid waste pits, animal excreta and other sources of pollution are located as far away as possible from the water source and on ground lower in elevation than the water source. There is no stagnant water within 5 metres of the water source. The water collection buckets or hand pumps at the source are kept clean.

Unprotected sources are those with no barrier or other structure to protect the water from contamination. All surface water sources such as lakes, rivers and streams or poorly constructed wells are examples of unprotected sources. Water from unprotected sources cannot be considered safe to drink unless it has been treated. The terms 'improved' and 'unimproved' are also used to describe water sources and are broadly equivalent to 'protected' and 'unprotected'. WHO /UNICEF categorises water sources as shown in Figure 2.2. This shows the drinking water ladder, which describes the steps in improvement of quality of water supply depending on the type of source. Surface water is at the bottom of the ladder and piped water into the household is at the top.



Figure 2.2 Drinking Water Ladder

### Overutilization and Pollution of Surface and Groundwater

With the growth of human population there is an ever increasing need for larger amounts of water to fulfil a variety of human needs. It is becoming increasingly difficult to meet these requirements today.

Overutilization of water occurs at various levels. People tend to consume more water than they really need. Many people waste water during bathing and washing of clothes. Agriculturists use more water than necessary to grow crops. Use of newer methods like drip irrigation systems can reduce the use of water without reducing yields.

Agriculture also contributes to the pollution of surface water and underground water stores by the excessive use of chemical fertilizers and pesticides. Use of biomass, nontoxic pesticides such as neem products and use of integrated pest management systems reduces the agricultural pollution of surface and ground water.

Industries tend to maximise short term economic gains by releasing liquid wastes into streams, rivers and the sea. In the longer term, as awareness of 'green products' made by Eco sensitive industries increases, people may even boycott the polluter's products. The industries that add to the pollution of environment by avoiding effluent treatment plants may eventually be caught, punished and even closed. Public awareness may increasingly put pressures on industry to produce only eco-friendly products which are already gaining in popularity. Public awareness about the serious health hazards caused by pesticides may put pressures on farmers to reduce the use of chemicals that are harmful to health.

### **Global Climate Change**

Increasing air pollution at a global level has resulted in climate change. In some regions global warming and the El Nino winds have created unprecedented storms and in other places they lead to long droughts. Everywhere the 'greenhouse effect' due to atmospheric pollution is leading to increasingly erratic and unpredictable climatic effects. This has seriously affected regional hydrological conditions.

### **Floods**

Floods have been a serious environmental hazard for centuries. However, the havoc raised by rivers overflowing their banks has become progressively more damaging, as people have deforested catchments and intensified use of river flood plains that once acted as safety valves. Wetlands in flood plains are nature's flood control systems into which overfilled rivers could spill and act like a temporary sponge holding the water and preventing fast flowing water from damaging surrounding land. Deforestation in the Himalayas causes floods that kill people, damage crops and destroy homes in the Ganges and its tributaries and the Brahmaputra. Rivers change their course during floods and tons of valuable soil is lost to the sea. As the forests are degraded, rainwater no longer percolates slowly into the subsoil but runs off down the mountainside bearing large amounts of topsoil. This Chapters rivers temporarily but gives way as the pressure mounts allowing enormous quantities of water to wash suddenly down into the plains below. There, rivers swell, burst their banks and flood waters spread to engulf peoples' farms and homes.

### **Drought**

In most arid regions of the world the rains are unpredictable. This leads to a time of serious scarcity of water to drink, use in farms, or provide for urban and industrial use. Drought prone areas thus regularly face irregular periods of famine. Agriculturists face serious loss of income during this period and they live in constant fear of droughts. India has 'Drought Prone Areas Development Programs' which are used in such areas to buffer the effects of droughts. Under these schemes, people are given wages in bad years to build roads, minor irrigation works and plantation programs. Drought has been

a major problem in our country especially in arid regions. It is an unpredictable climatic condition and occurs due to the failure of one or more monsoons. It varies in frequency in different parts of our country. While it is not feasible to prevent the failure of the monsoon, good environmental management can reduce its ill effects. The scarcity of water during drought years affects homes, agriculture and industry. It also leads to food shortages and malnutrition which especially affects children.

Several preventive measures can be taken to minimise the serious impacts of droughts so that its effect on local people is minimised.

One of the major failures our country faces is that when we have adequate monsoons, we fail to use water judiciously and conserve it. This results in scarcity of drinking water when rains are poor. Deforestation is one of the factors that worsen the effect of drought. Once hill slopes are denuded of forest cover the rainwater rushes down the rivers and is lost. Forest cover permits water to be held in the area permitting it to seep into the ground. This recharges the underground stores of water in natural aquifers. This can be used in drought years if the stores have been filled during a good monsoon. If water from the underground stores is overused, the water table drops, and vegetation suffers. Thus, soil and water management and afforestation are long term measures that reduce the impact of droughts.

### **Water for Agriculture and Power Generation**

India's increasing demand for water for intensive irrigated agriculture, for generating electricity, and for consumption in urban and industrial centres, has been met by creating large dams. Irrigated areas increased from 40 million hectares in 1900 to 100 million hectares in 1950 and to 271 million hectares by 1998. Dams support 30 to 40% of this area.

Although dams ensure continuous supply of water for domestic use annually, provide extra water for agriculture, industry, hydropower generation, they have several serious environmental problems. They alter river flows, change nature's flood control mechanisms such as wetlands and flood plains, and destroy the lives of local people and the habitats of wild plant and animal species. Irrigation to support cash crops like sugarcane produces an unequal distribution of water. Large landholders on the banks of canals get the lion's share of water, while poor, small farmers get less and are seriously affected.

### **Sustainable Water Management**

'Save water' campaigns are essential to make people aware of the dangers of water scarcity. Several measures need to be taken for better management of the world's water resources. These include measures such as

- Building several small reservoirs instead of few mega projects.
- Develop small catchment dams and protect wetlands.
- Soil management, micro catchment development and afforestation permits recharging of underground aquifers thus reducing the need for large dams.
- Treating and recycling municipal wastewater for agricultural use.
- Preventing leakages from dams and canals.
- Preventing loss in municipal pipes.
- Effective rainwater harvesting in urban environments.
- Water conservation measures in agriculture such as using drip irrigation.

- Pricing water at its real value makes people use it more responsibly and efficiently and reduces water wasting.
- In deforested areas where land has been degraded, soil management by bunding along the hill slopes and making 'nala' plugs can help retain moisture and make it possible to revegetate degraded areas.

### Case Study

#### Water Pollution Nepal

The Narayani River of Nepal has been polluted by factories located on its bank. This has endangered fish, dolphins, crocodiles and other flora and fauna of the region.

#### To Do Activity

Observe a nearby pond in different seasons and document the seasonal changes in it. One can also observe changes in a river or the seasonal changes in a forest or grassland.

### 1.2 Watershed

Our country can boast of nearly two third area of land as agriculture field. This area is mainly rainfed agriculture and due to erratic rainfall and low levels of inputs it faces very low productivity. Though water resources are limited, we should focus on increasing the productivity in rainfed areas by adopting watershed management approach based on the active participation of the people at all stages of the project. This will sustain agriculture and inclusive socioeconomic development. It also deals with the reclamation of degraded soils by employing biological and engineering measures. The integrated watershed management comprises of agriculture and inclusive socioeconomic development. Panchayati Raj Institutions play a vital role by adopting watershed management approach based on the active participation of the people at all the stages of the project. Participatory watershed management approach based on community organization will lead to resource conservation, productivity enhancement and livelihoods opportunities for all round socioeconomic development.

The watershed projects need continuous monitoring and evaluation to assess the impact of various activities on socioeconomic development of the region. Monitoring and assessment are also helpful to improve the performance of existing watershed activities and better planning and design of new activities. Watershed management activities are undertaken to preserve existing sustainable land use practices and restore the existing conditions to a desirable level. Preventive strategies refer to the measures to prevent a particular problem in a watershed. Remote sensing and information technology go a long way in effective planning, implementation and evaluation of the watershed programmes.

#### Concept

Our country is facing acute poverty due to unsustainable agricultural practices. Though 65% of the cultivated area in the country is rainfed, agricultural development is highly unsatisfactory. Low productivity in rainfed agriculture is due to unpredictable rainfall and low level of inputs. In order to increase food production with available limited water resources, it is essential that the rainfed farming should be developed as a sustainable productive system by adopting watershed management approach. Watershed management not only deals with reclamation of degraded soils by employing biological and engineering measures but also enhances crop productivity by a package of water

conservation and improved cropping practices. The integrated watershed management comprises of agriculture and allied activities and this might result in long term agriculture sustainability and wellbeing of the people. Strong linkages among central, state, district, village and project level agencies including Panchayati Raj Institutions are crucial for effective management of watershed development projects. The bottom up instead of top down approach ensures active participation of the watershed community in different phases of the project which is essential to achieve desired objectives. Remote sensing and GIS facilitate development planning process for conserving land and water resources.

### **Meaning**

The term watershed consists of two words water and shed. Water occurs in nature in three forms namely solid, liquid and vapour. In watershed, water is considered mainly in liquid form. The word "shed" refers to the roof of a shed which collects rainwater and drains out. Shed thus can be defined as an area well marked by a boundary which receives rainwater and drains out towards a common drainage point or outlet.

Watersheds are areas of land defined by the flow patterns of rainwater or melting snow and ice when it is determined by topography of a region rather than political boundaries. In more general terms a watershed is a geographic area where all the water, sediments, and dissolved materials drain to a common outlet like a stream, river system, reservoir, lake, underground aquifer, estuary, wetland, sea, ocean or other body of water. It can also be an area that "catches" water and routes it to a common basin, channel, or network of channels. In the technical sense, a watershed refers to a divide that separates one drainage area from another drainage area. Watersheds drain into other watersheds in a hierarchical pattern, with smaller sub watersheds combining into larger watersheds. However, the term is often used to mean a drainage basin or catchment area itself. Other terms that are used to describe a watershed are catchment, catchment basin, drainage area, river basin, and water basin.

Watersheds are similar but not identical to hydrologic units, which are drainage areas delineated so as to nest into a multilevel hierarchical drainage system. Hydrologic units are designed to allow multiple inlets, outlets, or sinks. In a strict sense, all watersheds are hydrologic units but not all hydrologic units are watersheds. The watershed acts as a funnel by collecting all the water within the area covered by the basin and channelling it to a single point. Each watershed or drainage basin is separated topographically from adjacent basins by a geographical barrier such as a ridge, hill or mountain in hilly country, but in flat country especially where the ground is marshy, the divide may be invisible with just a more or less national line on the ground on either side of which falling raindrops will start a journey to different rivers, and even to different sides of a region or continent.

Watershed or drainage divides are important geographically and in determining political boundaries. Roads such as ridge ways and rail tracks often follow divides to minimise gradients, and to avoid marshes and rivers. In another way, watershed can be a hindrance to river navigation. In preindustrial times water divides were crossed at portages. Later, canals were built to connect the adjoining watersheds.

### **Definition of Watershed**

Watershed is a topographically delineated area drained by a stream system i.e. the total land area above some point on a stream or river that drains down slope to the lowest point. The watershed is a



hydrologic Chapter often used as physical Chapter, biological Chapter and a socioeconomic and political Chapter for planning and management of natural resources. Watershed may also be defined as a natural Chapter of land which collects water and drains through a common point called an outlet by a system of drains. Therefore, watershed is the area encompassing the catchments, command and delta area of a stream. The topmost portion of the watershed is known as "ridge" and a line joining the ridge portion along the boundary of the watershed is called as "ridgeline". A watershed is thus a logical Chapter for planning optimal development of its soil, water and biomass resources.

### **Types of Watershed**

Watersheds are classified into five based on the size, drainage, shape and land use pattern.

- Macro watershed (> 50,000 Hectares)
- Sub watershed (10,000 to 50,000 Hectares)
- Milli watershed (1000 to 10000 Hectares)
- Micro watershed (100 to 1000 Hectares)
- Mini watershed (100 Hectares)

### **Watershed or Drainage divides can be categorised into three types**

#### **a. Continental Divide or Ocean Basins**

Continental divide is a divide in which the waters on each side flow to different oceans. The following is a list of some of the major ones

1. In North America, surface water drains to the Atlantic via the Saint Lawrence River and Great Lakes basins, the Eastern Seaboard of the Chaptered States, the Canadian Maritimes, and most of Newfoundland and Labrador. Nearly all of South America, east of the Andes also drains to the Atlantic, as does most of Western and Central Europe, and the greatest portion of western Sub Saharan Africa. The three major Mediterranean seas of the world also flow to the Atlantic.
  - (i) The American Mediterranean Sea (the Caribbean Sea and Gulf of Mexico) basin includes most of the American interior between the Appalachian and Rocky Mountain ranges, a small part of the Canadian provinces of Alberta and Saskatchewan, eastern Central America, the islands of the Caribbean and the Gulf, and a small part of northern South America.
  - (ii) The European Mediterranean Sea basin includes much of northern Africa, east central Africa (through the Nile), southern, central, and eastern Europe, Turkey, and the coastal areas of Israel, Lebanon, and Syria.
  - (iii) The Arctic Ocean basin drains most of Western and Northern Canada east of the Continental Divide, the north shore of Alaska and parts of North Dakota, South Dakota, Minnesota, and Montana in the Chaptered States, the north shore of the Scandinavian Peninsula in Europe, and much of central and northern Russia.
2. About 13% of the land in the world drains to the Pacific Ocean. Its basin includes much of China, southeaster Russia, Japan, Korea, most of Indonesia and Malaysia, the Philippines, all of the Pacific Islands, the northeast coast of Australia, and the western parts of Canada, the Chaptered States (including most of Alaska), Central America, and South America.

3. The Indian Ocean's drainage basin also comprises about 13% of Earth's land. It drains the eastern coast of Africa, the coasts of the Red Sea and the Persian Gulf, the Indian subcontinent, Burma, and most of Australia.
4. The Southern Ocean drains to Antarctica. Antarctica comprises approximately eight percent of the Earth's land.

**b. Major and Minor Drainage Divide**

In the major drainage divide, the waters on each side of the divide never meet again but do flows into the same ocean. On the other hand, in the Minor drainage divide, the waters part but eventually join again at a river confluence. The three largest river basins (by area), from largest to smallest, are the Amazon basin, the Congo basin, and the Mississippi basin while the three rivers that drain the most water, from most to least, are the Amazon, Congo, and Ganges Rivers.

**c. Endorheic Drainage Basins**

The Endorheic drainage basins are inland basins that do not drain to an ocean but drains to endorheic lakes or seas or sinks. The largest of these consists of much of the interior of Asia and drains into the Caspian Sea and the Aral Sea. Other endorheic regions include the Great Basin in the Chaptered States, much of the Sahara Desert, the watershed of the Okavango River (Kalahari Basin), highlands near the African Great Lakes, the interiors of Australia and the Arabian Peninsula, and parts in Mexico and the Andes.

### **Characteristics of Watershed**

Every watershed has distinct characteristics and one watershed is different from the other. Size, shape, drainage area and length are the main characteristics to be considered for watershed management.

**Size** The size of a watershed may vary from a few square meters to thousands of square kilometres depending on the time and money available for development of a watershed. Larger watersheds could be selected in the plain valley areas or where grassland and forest development are the major objectives. In the hilly areas or where intensive agriculture development is involved, the size of the watershed would be small.

**Shape** Watersheds have a variety of shapes such as pear, elongated, triangular, circular etc. based on morphologic parameters like geology and structure. It determines the length width ratio which affects the runoff characteristics like runoff time. In a circular watershed, runoff from various parts of the watershed reaches the outlet at the same time. However, an elliptical watershed has the outlet at one end of the major axis and though it has the same area as the circular watershed. It would cause the runoff to be spread out over time, thus producing a smaller flood peak than that of the circular watershed.

**Length** of watershed is important in hydrologic computations and is defined as the distance measured along the main channel from the watershed outlet to the basin divide. The length is usually used in computing a time parameter, which is a measure of the travel time of water through a watershed.

**Slope** is an important factor which corresponds to distance along the principal flow path.



**Drainage Area** The drainage area (A) is probably the single most important watershed characteristic for hydrologic design as it reflects the volume of water that can be generated from rainfall.

**Drainage Density** Drainage density is an important characteristic of the watershed that influences runoff. It is defined as the ratio of total length of all streams and catchment area. High drainage density drains result in faster runoff and increase the peak of hydrograph.

### **Watershed Factors**

The important watershed factors that determine likelihood of flood are topography, shape, size, soil type and land use (paved or roofed areas). In other words; topography and shape determine the time taken for rainwater to reach the river whereas size, soil type and development determine the amount of water that reaches the river.

### **Topography**

Topography determines the speed with which the runoff will reach a river. Rain that falls in steep mountainous areas will reach the river faster than flat or gently sloping areas.

### **Shape**

Shape contributes to the speed with which the runoff reaches a river. A long thin watershed will take longer to drain than a circular watershed.

### **Size**

Size will help determine the amount of water reaching the river. The larger the watershed, the greater the potential for flooding.

### **Soil Type**

Soil type will help determine the amount of water that reaches the river and certain soil types contribute to flooding. Soil types such as sandy soils are very free draining and rainfall on sandy soil is likely to be absorbed by the ground. On the other hand, soils containing clay can be almost impermeable and therefore rainfall on clay soils will run off and contribute to flood volumes. After prolonged rainfall even free draining soils can become saturated and any further rainfall will reach the river rather than being absorbed by the ground.

### **Land Use**

Land use can contribute to the volume of water reaching the river like clay soils. For example, rainfall on roofs, pavements and roads will be collected by rivers with almost no absorption into the groundwater.

## **2.3 Watershed Management – Benefits, Objectives and Components**

Watershed management is the process of guiding and organizing use of land and other resources in the watershed to provide desired goods and services without adversely affecting soil, water and other natural resources.

Watershed management in the broader sense includes maintaining the equilibrium between elements of natural ecosystem or vegetation, land or water on the one hand and human activities on the other hand. The watershed management programmes aim at improving soil health, soil tilth and drainage and achieving efficient use of harvested and stored rainwater for supplemental irrigation and consequently enhanced productivity and higher economic returns. From community development

point of view, watershed management programmes aim at controlling flooding, water logging and soil erosion in order to increase agricultural productivity and a more dependable, cleaner water supply for domestic and industrial use. These programmes also help in minimizing risk of floods in rural and urban areas down streams, reducing sedimentation and conserving natural resources efficiently and effectively. Watershed management programmes strive to improve the lot of the entire farming communities rather than focusing on individual farmers only.

### **Benefits of Watershed Management**

Watershed management is expected to ensure the following benefits

- controls floods, erosion and sedimentation
- enhances productivity per Chapter area, per Chapter time and per Chapter of water
- increases cropping intensity
- leads to proper utilization of waste lands through alternate land use systems
- ensures ecological balance
- maximizes income through integrated farming system
- stabilizes income even under unfavourable weather conditions.

### **Objectives of Watershed Management**

The main objective of watershed management is to overcome the problems of land and water use based on interdependence of all the resources. The ultimate aim of watershed is enhancing the standard of living of common man in the basin by optimising his earning capacity, by providing basic facilities such as drinking water, electricity, water for irrigation, freedom from fear of floods and droughts etc. Watershed management aims at optimum utilization of the entire resources namely soil, water, crop including plantation, livestock, fishery and human population for sustained prosperity of the watersheds. The overall objectives of watershed development programme are outlined below

- Recognition of watersheds as a proper Chapter for utilization and development of land. The land should be treated according to its peculiar need and by methods that will control soil erosion, conserve water, encourage wildlife, improve farm income and prevent flood damage to agricultural lands.
- Retardation and prevention of floods through small multipurpose reservoirs and other water impounding structures at the streams and in problem areas.
- Provision for an abundant water supply for domestic, industrial and agricultural needs.
- Minimizing organic, inorganic and soil pollution.
- Expansion of recreational facilities including picnic and camping sites with more lakes and streams suitable for boating, fishing or swimming.
- Utilization of local natural resources for improving agriculture and utilization of allied occupation or industries (small and cottage industries) to improve socioeconomic conditions of the local residents and minimizing risks during aberrant weather conditions.
- Improving infrastructural facilities to improve storage, transportation and marketing of the agricultural produce.
- Setting up small scale agro industries.
- Improving the socioeconomic status of farmers.
- Employment generation.
- Encouraging people participation.

Active participation of farmers is essential for the proper implementation of the programme. The above objectives can be achieved only by planning and implementing the programme in a systematic way. Constitution of cooperative watershed management societies also help in achieving the objectives.

### **Components of Watershed Management**

Two major components of watershed management are Engineering and Biological Practices.

#### **Engineering and Biological Practices**

Engineering and biological practices for soil and water conservation include measures for land, water and biomass management in uncultivable lands. These practices are cost intensive and must be carried out with government support.

#### **Land Management**

Land and water both are the most important natural resources for agriculture sustainability. The upper layer of soil plays a crucial role in providing nutrition to the plants and therefore needs to be protected and conserved. Depending on the soil characteristics, topography, climate and rainfall pattern, appropriate measures need to be taken in order to control soil erosion and thus maintain soil productivity. The biological or agronomic measures have proved to be effective for controlling both wind and water erosion by employing agronomic practices which include conservation tillage, contour cultivation, strip cropping and vegetative barriers. Mechanical measures include a wide variety of conservation practices and structures such as contour bunds, graded bunds, earthen bunds, contour terrace, contour trenches, bench terracing, channel walls, stream bank stabilization, check dams, gully plugging etc. depending on land characteristics.

#### **Water Management**

Water is the most important natural resource required for regular activities of all the sectors viz., agriculture, industry and domestic. Only 4% share of world's fresh water is available in India for supporting 16% of world population. Mismanagement of restricted water resource results in recurring floods and droughts. Irrigation is the biggest user of fresh water, but its share is likely to be reduced considerably due to competing demand from other users like industry and public health due to ever growing population. On the other hand, overexploitation of groundwater has led to its rapid depletion and deterioration in water quality. It is, therefore, imperative that this natural resource is managed in the most optimum way in order to meet its growing demand. More than 60% of agriculture is rainfed. The rainfall distribution in the country is highly erratic and variable in time and space. Over 80% rainfall is received during monsoon months of July, August and September. It is therefore of utmost importance to manage the existing surface and groundwater resources for their longterm sustainability.

The rainwater harvesting has an important role to play in augmenting these declining resources. It is a technique of harvesting, collection and storage of rainwater aiming at conserving, storing and utilizing every drop of rainwater harvested for various users and recharging groundwater reservoirs. The harvested rainwater has immense potential for not only enhancing water availability in both rural and urban areas but recharging surface and ground water reservoirs. Rainwater harvesting based on local traditional knowledge has been an ancient practice successfully used for augmenting water resources. Biomass Management The forest management and conservation, social forestry, Eco

preservation and enhancing animal productivity are some of the main aspects for ensuring biomass management.

## 2.4 Watershed Management Indian and Global Perspectives

India has the second highest population in the world which is over 1.3 billion [i.e., 17.1% of the world

### To Do Activity

Visit a nearby hill station and observe the agricultural practices being adopted there. Examine the measures used for controlling soil erosion.

population], a seventh highest land area of 3.29 million km<sup>2</sup> among all the nations [i.e., 2.4% of the world area] and an annual river flow of 1869 km<sup>3</sup> out of an annual rainfall of about 4000 km<sup>3</sup> [i.e., 4% of the world water]. The rainfall distribution is highly uneven spatially with the highest annual rainfall of 11,690 mm in the northeastern state of Meghalaya and the least annual rainfall of 150 mm in the western part of the north western state of Rajasthan. The number of rainy days [i.e., number of days with a minimum recorded daily rainfall of 2.5 mm] varies from 5 to 150. The rainfall distribution is also very uneven temporally with about 75% of the annual rainfall occurring only in the four monsoon months of June to September. The average annual rainfall is 1160 mm which is slightly higher than the global average of 1110 mm. In the year 2010, the annual per capita water availability was estimated at 1588 m<sup>3</sup>, which is considered as water stressed [i.e., between 1,000 and 1,700 m<sup>3</sup>] as per the international norms. The per capita water availability was 5200 m<sup>3</sup> during the year 1951. The annual potential evapotranspiration (PET) varies from 1,500 to 3,500 mm.

Although India has a well-developed precipitation pattern in the form of monsoons and an equally well developed drainage network consisting of 14 large river basins, 44 medium river basins and hundreds of small river basins, there is a huge stress on water and land resources due to continuous overexploitation. This has led to many adverse hydrometeorological impacts like large scale soil erosion, excessive lowering of water table, extensive river/ ground water pollution due to municipal/industrial wastewaters, widespread loss of forests/ grass lands/ crop lands/ wetlands/ water bodies, silting of existing water bodies, frequent occurrence of floods/ droughts, alarming reduction in Himalayan glaciers etc. All these phenomena have generally made the Indian perspective in watershed management very vulnerable to climatic and anthropogenic factors. Thus, achieving sustainable water resources development and integrated watershed management are two major challenges in the Indian context.

Despite this alarming scenario, there are hundreds of best management practices (BMPs) –adopted both in the government sector and the nongovernment sector over the entire length and breadth of India, which are commendable in water and land resources management. These BMPs employ technologies which are either traditional or modern or a combination of both. Some of these BMPs which were effectively implemented in different parts of India, are as follows

1. An effective implementation of the ban on tree cutting policy by the local government authorities in the north-eastern state of Sikkim resulted in an increase in the forest cover from 44% in 1995'96 to 47.59% in 2009 [Hindustan Times, 2010].
2. During 2000 to 2006, voluntary work by hundreds of people led by a spiritual saint near Jalandhar in the north Indian state of Punjab, resulted in the near total cleaning and

rejuvenation of 35 km of Kali Bein River, which was heavily polluted by industrial effluents and garbage [The Times of India, 2007].

3. Over a 20-year period starting from 1974, a severely drought-prone village of Ralegan Siddhi in the western Indian state of Maharashtra with an annual rainfall of about 200 mm, had been transformed into a village with ample drinking water, food and fodder. This was possible due to the adoption of ridge to valley approach in watershed management through social forestry, grassland development, continuous contour trenching, loose boulder structures, brushwood dams, nulla bunds, percolation tanks, underground dams, gabion bunds, check dams, farm ponds, staggered trenches for arresting soil erosion and ban on free grazing [Hazare, 1994].

Global perspective on watershed management is having many similarities and some differences with the Indian perspective. Moreover, there are even bigger spatial and temporal variations in water/pollutant distribution. It is also very much affected by soil erosion, excessive lowering of water table, extensive river/ground water pollution due to municipal/industrial wastewaters, widespread loss of forests/ grass lands/ crop lands/ wetlands/ water bodies, silting of existing water bodies, frequent occurrence of floods/ droughts, alarming reduction in glaciers etc. These phenomena have resulted in major constraints due to water scarcity and land scarcity. However, in majority of the developed world and in many parts of the developing world, sufficient watershed management activities have been initiated in the government and nongovernmental sectors.

The impact of these watershed management programs is varied ranging from failures with undesirable environmental and socioeconomic consequences to significant benefits. To make the watershed management programs sustainable, land and water resources need to be managed together with an interdisciplinary approach. There is also a strong need to develop regional training and networking programs at all levels, especially when government agencies are not fulfilling their role in watershed management. The emergence of citizen-based watershed organizations in the Chaptered States and many other countries is a very positive development.

### **Watershed Development Programs in India**

Watershed activities regarding hydrological monitoring were initiated in 42 small watersheds located in 8 centres of Central Soil and Water Conservation Research and Training Institute (CSWCRTI) in 1956. Subsequently watershed-based Operational Research Projects (ORPs) were taken up in different parts of the country in 1974, in order to reduce soil loss, increase water availability to enhance cropping intensity, agricultural productivity and generate employment. The central and state governments have undertaken various development programmes based on watershed approach as outlined below. The Ministry of Rural Development, Government of India is a front runner in these efforts and has implemented special area development programmes for water harvesting.

1. **Soil Conservation in Catchment of River Valley Project**  
The programme was initiated during the Third Five Year Plan to treat catchment area for reducing silt production rate and subsequent siltation of reservoirs, checking soil erosion and consequently improving agricultural productivity.
2. **Integrated Agricultural Development in Drought Prone Areas**  
The Drought Prone Area Programme (DPAP) of Government of India aimed at promoting integrated agricultural development in dry farming regions based on ecologically balanced approach instead of providing temporary relief.

3. Desert Development Programme (DDP)  
The programme was initiated in 1977 to control desertification of the desert area by integrating and linking other related state/central programmes and conserve and harness land, water and other natural resources including rainfall for restoration of long term ecological balance.
4. Himalayan Watershed Management Project in Uttar Pradesh  
Himalayan watershed management project funded by the World Bank was taken up in 1983 in two watersheds namely Nayar in Garhwal and Panarin Kumaon regions in Uttarakhand covering an area of 2.47 lakh hectares.
5. Operational Research Projects on Integrated Watershed Management  
These projects were taken up in 47 watersheds spread over 16 states in 1983 covering an area of 35739 hectares with the financial assistance of Ministry of Agriculture and Rural Development, Government of India and under the technical guidance of Indian Council of Agricultural Research (ICAR).
6. National Watershed Development Programme of Rainfed Agriculture (NWDPA)  
The programme initiated in 1986 in the unirrigated arable lands in 25 states mostly had rainfall ranging between 500 and 1125 mm and more. The programme was restructured in the Eighth Five Year Plan in order to achieve sustainable production of biomass as well as restoration of ecological balance in the vast rainfed areas of the country.

### **Integrated Watershed Management**

Watershed management mainly involves adoption of soil and water conservation practices such as proper land use, preventing land against all forms of deterioration, maintaining soil fertility, conserving water for farm use and increasing productivity, proper water management for drainage and flood protection. All the natural resources in a watershed should be used as efficiently as possible with minimum watershed degradation. In watersheds besides development of new water resources, emphasis is laid on efficient utilization of existing water resources based on indigenous technologies. The watershed management is rational utilization and conservation of land, water and biodiversity of natural resources without further deterioration of environment. It is an integrated participatory approach for sustainable development of natural resources. People's participation at all stages starting from planning up to its implementation is an important element in its proper execution. Watershed is a single window approach where all problems of watershed area are addressed, and solutions sought. Watershed management is an ongoing process. It is, therefore, essential that original watershed plans should be revised in case of new challenges.

Watershed management is an integral approach for sustainable use of natural resources, viz, land, water, vegetation, livestock, fisheries and human resources. In watersheds, integrated farming systems approach is followed. In addition to low external input of sustainable agriculture, it also includes agroforestry, horticulture, silvipasture, aquaculture, animal husbandry, apiculture, sericulture, lac culture etc. This ensures full utilization of resources for employment generation and overall development of the watershed area. In agroforestry system, different species of trees grown under different situations such as floods, drought and landslide, mine area, saline and alkaline conditions are identified.

### **2.5 Various Issues in Watershed Management**

Various problems and constraints in watershed management are given below.

- a. Land degradation in rainfed areas due to soil erosion from runoff is one of the major problems in watershed management. It was estimated that soil erosion in the 1990s was almost double that of soil erosion in the 1980s in our country. Rainfall uncertainty and poor economic conditions also act as major constraints and thus prevents the farmers in rainfed areas from making investments. This leads to improper watershed management.
- b. Equitable benefit sharing of watershed management within the farming communities as well as within the different locations of watershed is a huge problem. Generally, women, marginal farmers and landless laborers gain very little or nothing at all from the watershed management activities. Several case studies in water scarce states of Gujarat and Madhya Pradesh in India have showed that overdevelopment of water harvesting structures in the upstream portion of watersheds had significantly reduced the inflows into the downstream reservoirs. On the other hand, it is also noticed that building of large reservoirs resulted in the submergence and hardship in the upstream parts and benefits for people in the downstream parts of the same watershed or a neighbouring watershed generally having an urban or an industrial area.
- c. Acute shortage of water in general and drinking water especially in summer has been observed in many watersheds with inadequate watershed management which may result in severe/ recurrent droughts. It may often result in limited and temporary food productivity gains.
- d. Many a times, common lands do not get treated adequately and re-vegetation does not take place as expected in spite of watershed management programs. As a result of this, domestic/ ecosystem water requirements, and livestock water/ fodder needs are either inadequately addressed or are made to suffer due to increased water withdrawals by other uses or due to overgrazing.
- e. Problems exist or new problems crop up due to improper understanding of the interaction between biophysical and socioeconomic processes in watershed management.
- f. Conflict among various government ministries such as those related to agriculture [with emphasis on food production], rural development [with emphasis on employment generation & poverty alleviation], forests [with emphasis on maintaining biodiversity & wildlife], as well as conflict between government bureaucracy and elected representatives in their zeal to control funds, is a major problem in watershed management programs which requires to be resolved on a priority basis.
- g. It is hard to conduct meaningful impact assessment studies on watershed management programs for lack of baseline data for monitoring and comparison of the current conditions. The whole exercise of watershed management is undertaken without properly estimating the water supply scenarios under drought/ normal/ surplus years as well as without proper demand management especially during drought years.
- h. Large areas inhabited with tribal population lack facilities to harvest water and to stabilize their food/ crop/ fodder production due to reduced forest yields, deterioration in land quality, lack of tribal agriculture policy and population pressure. This leads to a sustained misery, socio-political unrest and insurgency among the tribal population.

### **Surface Runoff Rainfall Runoff Relationship**

One of the important questions in hydrology is the amount of stream flow to a river in response to a given amount of rainfall. In order to understand this, we should know where the water goes when it

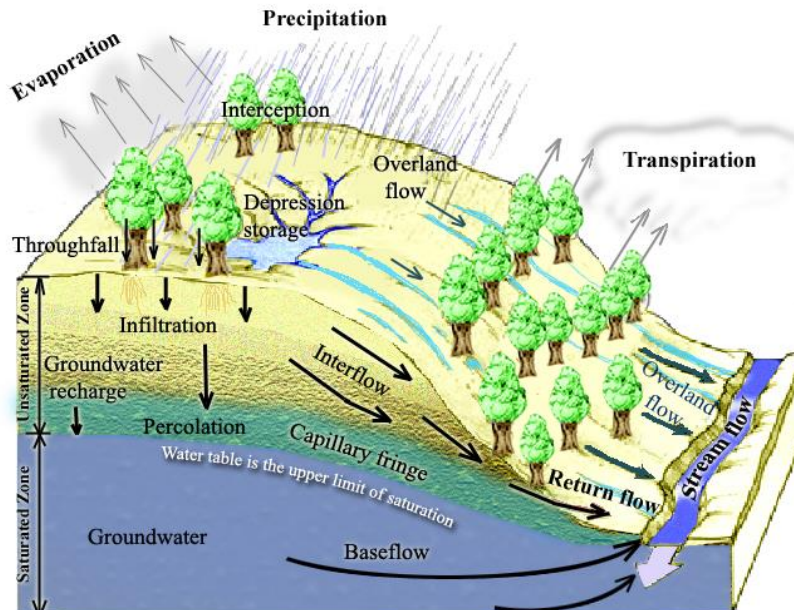


rains, how long water remains in a watershed, and what pathway does water take to the stream channel. These are the questions addressed in the study of rainfall – runoff processes, or more generally surface water input – runoff processes. The term, "surface water input" is used in preference to rainfall or precipitation to be inclusive of snowmelt as a driver for runoff.

To know the amount of runoff generated from surface water inputs requires partitioning water inputs at the earth surface into two components namely components that infiltrate and components that flow overland and directly enter streams. We should understand different pathways followed by infiltrated water. One of the pathways is that infiltrated water can follow subsurface pathways that take it to the stream relatively quickly which is called interflow or subsurface storm flow. Infiltrated water can also percolate to deep groundwater, which may sustain the steady flow in streams over much longer time scales that is called *base flow*. Infiltrated water can also remain in the soil to later evaporate or be transpired back to the atmosphere. The paths taken by water determine many of the characteristics of a landscape, the occurrence and size of floods, the uses to which land may be put and the strategies required for wise land management. Comprehending and modelling the rainfall – runoff process is therefore essential in many flood and water resources problems. Figure 2.3 illustrates schematically many of the processes involved in the generation of runoff.

The rainfall – runoff question is vital for the interface linking meteorology and hydrology. Quantifying and forecasting precipitation are in the sphere of meteorology and is part of the mission of the National Weather Service. Meteorological forcing is also a driver of snowmelt surface water inputs. River forecasting involves the use of meteorological variables as driving inputs to the surface hydrology system to obtain stream flow. The temporal and spatial scales associated with surface water inputs, given as output from meteorological processes have profound effects on the hydrological processes that partition water inputs at the earth surface. High intensity short duration rainfall is much more likely to exceed the capacity of the soil to infiltrate water and result in overland flow than a longer less intense rainfall. In arid climates with deep water tables, spatially concentrated rainfall on a small area may generate local runoff that then infiltrates downriver, whereas a more humid area with shallow water tables is less likely to be subject to stream infiltration losses and even gentle rainfall when widespread and accumulated over large areas may lead to large stream flows. Runoff includes *surface runoff* (overland flow) and *subsurface runoff* or *subsurface storm flow* (interflow).





**Figure 2.3 Physical Processes Involved in Runoff Generation**

(Source [https://www.google.com/search?q=Physical+Processes+Involved+in+Runoff+Generation&source=lnms&tbn=isch&sa=X&ved=0ahUKewi6kM6G6lAjAhVfMY8KHbuLDQ8Q\\_AUIESgC&biw=1366&bih=651#imgsrc=dleWlauxDjdE8M](https://www.google.com/search?q=Physical+Processes+Involved+in+Runoff+Generation&source=lnms&tbn=isch&sa=X&ved=0ahUKewi6kM6G6lAjAhVfMY8KHbuLDQ8Q_AUIESgC&biw=1366&bih=651#imgsrc=dleWlauxDjdE8M))

### **Erosion Control**

Erosion control is the process of preventing or controlling wind or water erosion in agriculture, land development, coastal areas, riverbanks and construction. Effective erosion controls handle surface runoff and are important techniques in preventing water pollution, soil loss, wildlife habitat loss and human property loss.

Erosion controls are used effectively in natural areas, agricultural settings or urban environments. In urban areas erosion controls are often part of storm water runoff management programs which is a requirement of local governments. The controls often involve the creation of a physical barrier, such as vegetation or rock, to absorb some of the energy of the wind or water that is causing the erosion. They also involve building and maintaining storm drains. On construction sites they are often implemented in conjunction with sediment controls such as sediment basins and silt fences.

Bank erosion is a natural process and without it, rivers would not meander and change course. However, land management patterns that change the hydrograph and/or vegetation cover can act as an agent to increase or decrease channel migration rates. In many places, whether or not the banks are unstable due to human activities, people try to keep a river in a single place. This can be done for environmental reclamation or to prevent a river from changing course into land that is being used by people. One way that this is done is by placing riprap or gabions along the bank.

### **Factors Affecting Water Erosion**

Water erosion occurs due to dispersive and transporting power of water. In water erosion, initially the soil particles are detached from the soil surface by the force of raindrop and then transported with surface runoff. There is a direct relationship between the soil loss and surface runoff volume. The water erosion process is influenced primarily by climate, topography, soils and vegetative cover. The following factors influence the water erosion.

**Climatic Factors** Climate includes rainfall, temperature and wind. The principal aspects of rainfall that influence the volume of runoff, erosion and sediment (potential) from a given area are intensity and duration of rainfall. As the volume and intensity of rainfall increase, the ability of water to detach and transport soil particles increases. When storms are frequent, intense, and of long duration, the potential for erosion of bare soils is high. Temperature has a major influence on soil erosion. Frozen soils are relatively erosion resistant. However, bare soils with high moisture content are subject to uplift or “spew” by freezing action and are usually easily eroded upon thawing. Wind contributes to the drying of soil and increases the need for irrigation for new plantings and for applying wind erosion control practices.

**Soil Characteristics** Soil characteristics include texture, structure, organic matter content and permeability. These characteristics greatly decide the erodibility of soil. Soils containing high percentages of sand and silt are the most susceptible to detachment because they lack inherent cohesive characteristics. However, the high infiltration rates of sands either prevent or delay runoff except where overland flow is concentrated. Clearly, well graded and well drained sands are usually the least erodible soils in the context of sheet and rill erosion. Clay and organic matter act as a binder to soil particles, thus reducing erodibility. As the clay and organic matter content of soils increase, the erodibility decreases. However, while clay has a tendency to resist erosion, they are easily transported by water once detached. Soils high in organic matter resist raindrop impact, and the organic matter also increases the binding characteristics of the soil. Sandy and silty soils on slopes are highly susceptible to gully erosion where flow concentrates because they lack inherent cohesiveness. Small clay particles, referred to as colloids, resist the action of gravity and remain in suspension for long periods of time. Colloids are potentially a major contributor to turbidity where they exist.

**Vegetation Cover** Vegetation cover is an extremely vital factor in reducing erosion at a place. It absorbs energy of raindrops, binds soil particles, slows down the velocity of runoff water, increases the ability of a soil to absorb water, removes subsurface water between rainfall events through the process of evapotranspiration and reduces offsite fugitive dust. In order to reduce soil erosion, we should limit the disturbances on vegetation cover and prevent the exposure of soils to erosive elements. Vegetations obstruct raindrops from directly falling on the land surface as well as in the flowing path of surface runoff. A good vegetative cover can nullify the effect of rainfall and protect the land from soil erosion.

**Topographic Effect** The main topographic factors which influence soil erosion are land slope, length of slope and shape of slope. The land slope or slope inclination is the main factor that affects the erosion. As the slope increases, the runoff coefficient, kinetic energy and carrying capacity of surface runoff also increases thereby decreasing the soil stability. Critical slope length is the slope length at which the soil erosion begins. It is related to the critical land inclination. Lower the critical inclination larger will be the critical slope length. The slope shapes have greater influence on erosion potential. The base of a slope is more susceptible to erosion than the top, because runoff has more momentum and is more concentrated as it approaches the base of slope. The slopes may be roughly convex or concave. On convex slope the above phenomenon is magnified, whereas on concave slope it is reduced. It is because in convex slope, the steepness increases towards bottom, while it is flattened towards bottom in case of concave slope.

### **Mechanical Measures for Water Erosion Control**

Mechanical practices are engineering measures that control the erosion from sloping land surfaces and thus land surface modification is done for retention and safe disposal of runoff water. The basic approach in this design is as follows (i) to increase the time of stay of runoff water in order to increase the infiltration time for water, (ii) to decrease the effect of land slope on runoff velocity by intercepting the slope at several points so that the velocity is less than the critical velocity, and (iii) to protect the soil from erosion caused by the runoff water. Generally, the mechanical measures adopted for soil and water conservation are bunding and terracing. Bonding is a mechanical method for control of soil erosion. When agronomical measures fail to control erosion, other mechanical measures are adopted.

### **Watershed Restoration and Prioritization**

In a watershed management programme, especially with large watersheds, it may not be feasible to treat the entire area of the watershed with land treatment measures. Identification and selection of few areas or sub watersheds having relatively more degradation problems are required for development planning and implementation of conservation activities according to the level of need and status of degradation. These few selected areas or sub watersheds within a large watershed are called priority watersheds. In this process, collection of sufficient biophysical and socioeconomic information is required for integrated watershed management planning. After effectively prioritizing watersheds or sub watersheds, a sub watershed management plan for each priority sub watershed is prepared in order to minimize natural and human induced hazards and to conserve valuable resources (soil, water, biodiversity and socio-cultural aspects). And finally, various integrated watershed management activities in the selected priority watershed (sub watershed) is implemented.

### **Factors Influencing Prioritizing Watersheds**

We face enormous soil and water degradation issues. Due to lack of both finances and expertise, a scientific approach to land resource management requires suitable methodology for clear identification of critical areas for treatment. Prioritization of areas into very high, high, medium, low and very low vulnerability helps in addressing the conservation and management efforts to secure maximum benefit.

Watershed prioritization is a prerequisite to operationalize any major scheme as it allows the planners and policy makers to adopt a selective approach considering the vastness of the catchment area, severity of the problems, constraints of funds and manpower demands of the local and political system. Though the prioritization of watersheds varies with the objectives of different schemes, the basic framework of watershed remains unchanged.

### **Benefits of Prioritization**

1. This approach is simple to adapt and useful for managers, as it combines the best available information from scientific investigations with the knowledge and intentions of local stakeholders.
2. While comparing among watersheds or varying condition within the same cluster type or across cluster types, this approach generates a relevant list of prioritized watersheds.
3. It assists the users in developing a profile of watersheds of interest, by graphically locating a watershed and obtaining relevant information about its vulnerability.
4. The contemplative process used to locate multiple watersheds is helpful in deciding upon a course of action with regard to prioritizing watershed protection and restoration.

## **Water Conservation**

Water conservation is a procedure that includes all the policies, strategies and activities to sustainably manage the natural resource of fresh water, to protect the hydrosphere, and to meet the current and future human demand. The consumption of water depends on population, household size, and growth and affluence. Climate change is one of the factors that have increased pressures on natural water resources especially in manufacturing and irrigation sector.

The goals of water conservation efforts include

- Ensuring availability of water for future generations where the withdrawal of freshwater from an ecosystem does not exceed its natural replacement rate.
- Energy conservation water pumping, delivery and wastewater treatment facilities consume large amount of energy. In some regions of the world over 15% of total electricity consumption is devoted to water management.
- Habitat conservation where minimizing human water use helps to preserve freshwater habitats for local wildlife and migrating waterfowl, but also water quality.

Water conservation can be profitable through the following activities

1. Water loss and waste of water resources should be minimised.
2. Any damage to water quality must be avoided.
3. Water management practices that reduce the use of water or enhance the beneficial use of water should be encouraged.

## **Strategies for Water Conservation**

Rainwater harvesting is one of the important strategies for water conservation. Digging ponds, lakes, canals, expanding the water reservoir, and installing rainwater catching ducts and filtration systems on homes are different methods of harvesting rainwater. Many countries still collect rainwater in clean containers, boil it and use it as potable water. Harvested and filtered rainwater can be used for varied purposes like in toilets, home gardening, irrigation of lawns and in small scale agriculture.

Protecting groundwater resources is another major strategy in water conservation. When precipitation occurs, some infiltrates the soil and goes underground. Water in this saturation zone is called groundwater. Contamination of groundwater prevents the use of groundwater as a source of fresh drinking water and the natural regeneration of contaminated groundwater can takes years to replenish. Examples of potential sources of groundwater contamination are storage tanks, septic systems, uncontrolled hazardous waste, landfills, atmospheric contaminants, chemicals, and road salts. Contamination of groundwater decreases the replenishment of available freshwater, so prevention of contamination of groundwater is important for water conservation.

Another strategy for water conservation is practicing sustainable methods of utilizing groundwater resources. Groundwater flows due to gravity and eventually discharges into streams. Surplus use of groundwater leads to a decrease in groundwater levels and if continued it can exhaust the resource. Ground and surface waters are connected, and therefore overuse of groundwater can decline the water supply of lakes, rivers, and streams. In coastal regions, excessive pumping of groundwater can increase saltwater intrusion which results in the contamination of groundwater water supply. Sustainable use of groundwater is essential in water conservation. A fundamental component to water conservation strategy is communication and education outreach of different water programs.

Developing communication to educate land managers, policy makers, farmers, and the general public about the necessity of conservation of groundwater is another important strategy for water conservation.

### **Ecosystem Services of Watershed**

Ecosystem services are nature's gift that humans freely gain from the natural environment and from properly functioning ecosystems. Such ecosystems comprising ecosystems, forest ecosystems, grassland ecosystems and aquatic ecosystems. Collectively, these benefits are known as 'ecosystem services', and are often integral to the provisioning of clean drinking water, the decomposition of wastes, and the natural pollination of crops and other plants.

Though scientists and environmentalists had been discussing the concept of ecosystem services implicitly for decades, it was popularized through the Millennium Ecosystem Assessment (MA) in the early 2000s. The ecosystem services are grouped into four broad categories provisioning, regulating, supporting and cultural. Provisioning includes the production of food and water; regulating involves the control of climate and disease; supporting meant nutrient cycles and oxygen production; and cultural contains spiritual and recreational benefits. To help inform decision makers, many ecosystem services are being assigned economic values. As per the 2006 Millennium Ecosystem Assessment (MA), ecosystem services are "the benefits people obtain from ecosystems". The MA also delineated the four categories of ecosystem services.

#### **To Do Activity**

How much water is needed by one person per day? Several international agencies and experts have proposed that 50 litres per person per day covers basic human water requirements for drinking, sanitation, bathing and food preparation. Estimate your average daily consumption of water.

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# Chapter 3 Food Resources Management

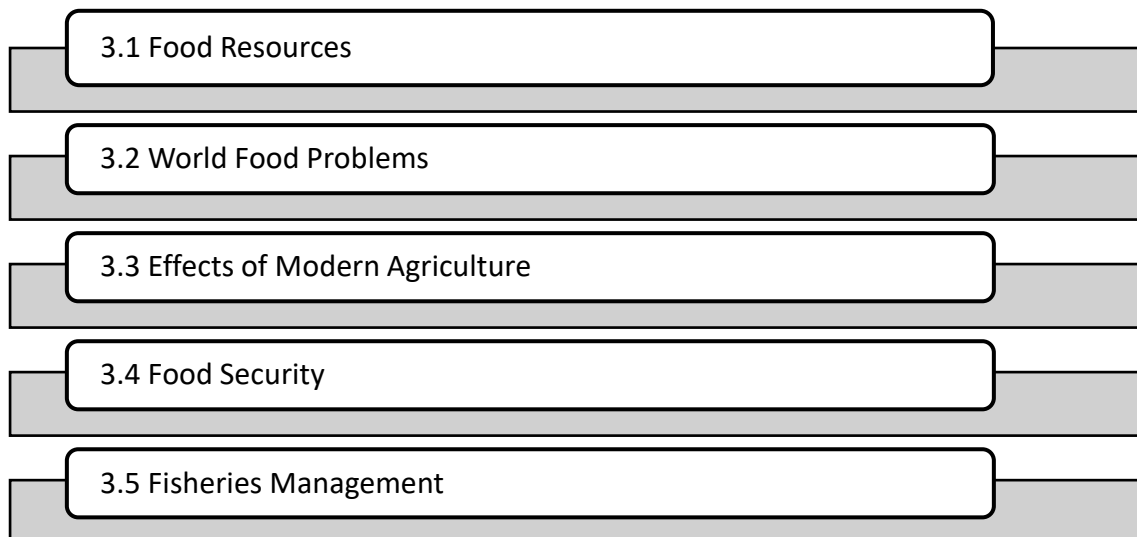
## Introduction

It is said that we are what we eat. Our existence and our aspirations as a society depend on the availability of, and access to, food. At the same time, our food depends directly on the condition of our natural resources. The food we grow, harvest, trade, transport, store, sell and consume is therefore one of the essential connecting threads between people, their culture and wellbeing, and the health of our planet. This Chapter focuses on food resources and their management.

## Objectives

- To explain about food resources –introduction, types and current scenario
- To explain the concept of world food problems and effects of modern agriculture
- To understand the concept of fisheries and their management

## Structure



## 3.1 Food Resources

India depends entirely on agriculture, animal husbandry and fishing for our supply of food. India is self-sufficient in food production, thanks to the modern patterns of agriculture. But it is unfortunate that these agricultural patterns are unsustainable and pollute our environment with excessive use of fertilizers and pesticides.

The FAO defines sustainable agriculture as that “which conserves land, water and plant and animal genetic resources, does not degrade the environment and is economically viable and socially acceptable.” Most of our large farms grow single crops (monoculture). If this crop is hit by a pest, the entire crop can be devastated, leaving the farmer with no income during the year.

On the other hand, if the farmer uses traditional varieties and grows several different crops, the chance of complete failure is lowered considerably. Many studies have shown that one can use alternatives to inorganic fertilizers and pesticides. This is known as Integrated Crop Management.



Food is essential for growth and development of living organisms. These essential materials are called nutrients and these nutrients are available from a variety of animals and plants. There are thousands of edible plants and animals over the world, out of which only about three dozen types constitute major food of humans.

### **Types of Food Sources**

A large population of people obtain food from cultivated plants and domesticated animals. Though oceans and freshwaters also provide food for humans, majority of human population depend on food obtained from traditional land based agriculture of crops and livestock.

### **Food Crops**

It is estimated that out of about 2,50,000 species of plants, only about 3,000 have been tried as agricultural crops. Under different agroclimatic condition, 300 are grown for food and only 100 are used on a large scale. Some species of crops provide food, whereas others provide commercial products like oils, fibres, etc. Raw crops are sometimes converted into valuable edible products by using different value addition techniques. At a global level, only 20 species of crops are used for food. These crops in the order of importance are wheat, rice, corn, potatoes, barley, sweet potatoes, cassavas, soybeans, oats, sorghum, millet, sugarcane, sugar beets, rye, peanuts, field beans, chickpeas, pigeon peas, bananas and coconuts. Many of these crops are used directly and some others are used by converting them into different forms and thus increasing its calorific value.

### **Livestock**

Another important food source is domesticated animals. The major domesticated animals used as food source by human beings are 'ruminants' (e.g. cattle, sheep, goats, camel, reindeer, llama, etc.). Ruminants convert indigestible woody tissue of plants (cellulose) which are earth's most abundant organic compound into digestible food products for human consumption. Milk, which is provided by milking animals, is considered as a complete food. Other domestic animals which are sources of meat are sheep, goat, poultry and ducks.

### **Aquaculture**

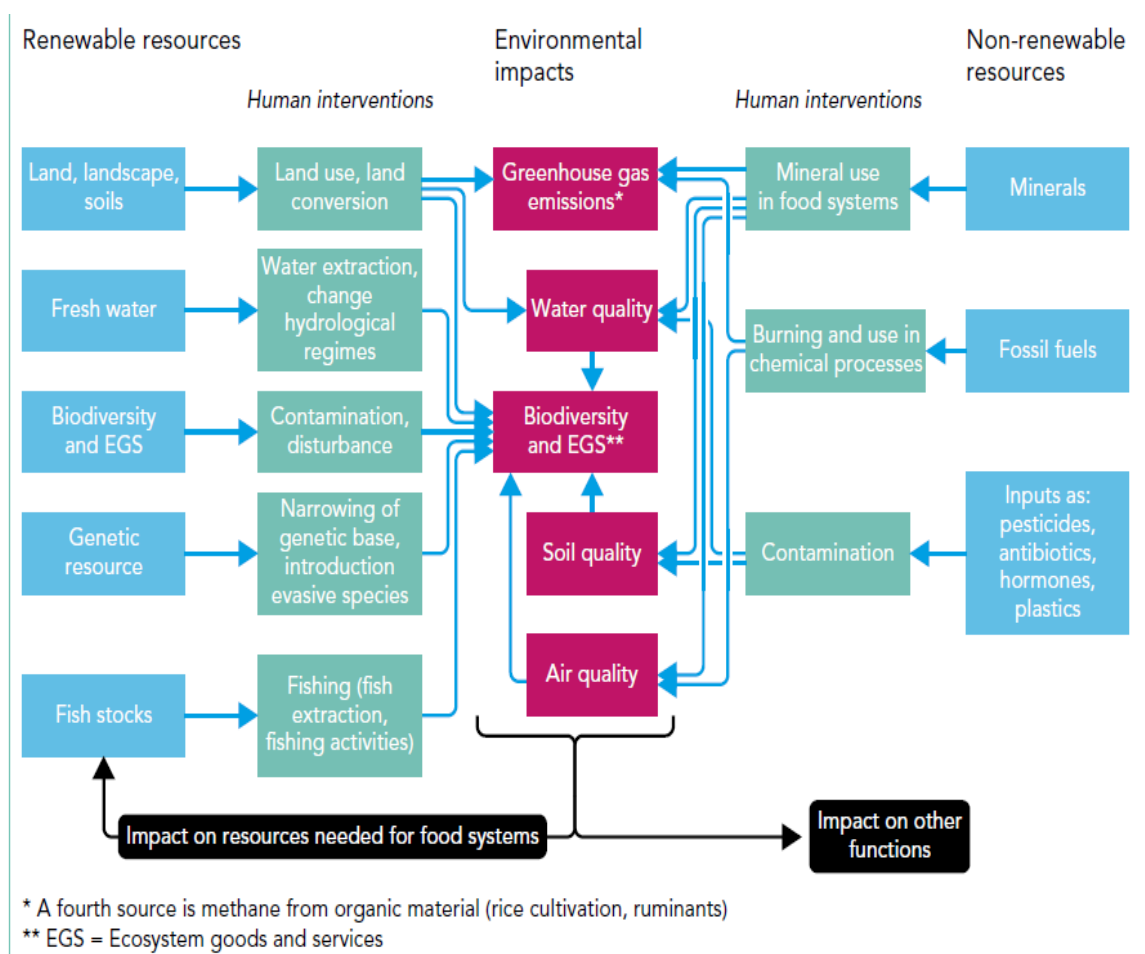
Fish and seafood contribute 17 million metric tonnes of high quality protein to provide balanced diet to the world. Though aquaculture contributes only for a small amount of food worldwide, its significance is increasing day by day.

### **Food System and Natural Resources – Current Scenario**

The present food systems we follow are considered unsustainable from a natural resources perspective. The way these food systems currently function is responsible for land degradation, depletion of fish stocks, nutrient losses, impacts on terrestrial and aquatic biodiversity, impacts on air, soil and water quality, and greenhouse gas emissions contributing to climate change. Various other factors like population growth, expansion of cities, dietary shifts to unhealthy and unsustainable consumption also will enhance the pressures on natural resources.

There are significant possibilities to separate food system activities from environmental degradation, especially by increasing efficiencies and improving the management of the natural resource base. Different methods for sustaining the environment are increasing efficiencies of livestock feed, nutrients, genetics and water. Efficiency of livestock feed need to be increased as farmed animals consume around 35% of the total crop production. Nutrient efficiency also requires enhancement as

the global average nutrient efficiency for nitrogen and phosphorus is only around 20%. New farming technologies (e.g. drip irrigation, ‘low till and precision agriculture’) and improved varieties of crops (e.g. crops which are more resilient to water and heat stresses) have the potential to increase the efficiency at multiple levels (e.g. lower nitrogen losses, lower water use, and higher productivity). This will lead to increased production of food with fewer resources. New farm and decision-making related innovations (e.g. use of mobile technology to provide price and weather related information to farmers, remote sensing monitoring) can help reduce on farm food losses and improve transparency in food markets thus reducing price volatility. More energy and water efficient food processing (e.g. dry extraction of plant sourced protein) is also possible. A reduction in food loss and waste across food systems, and a levelling off of meat and dairy consumption in developed countries could reduce the global cereal demand by 15%. The reduction of meat and dairy consumption by 50% in these countries could lead to up to 40% lower nutrient losses and greenhouse gas emissions.



**Figure 3.1 Relation between Resource use and Environmental Impacts Related to Food System Activities**

### 3.2 World Food Problems

In many developing countries where there is rapid expansion of population, the production of food is insufficient compared to the growing demand. Food production in 64 of the 105 developing countries is lagging behind their population growth levels. This is due to their inability to produce more food and their financial constraints to import it. India is one of the countries that have been able to produce



enough food according to the population demand by cultivating a large portion of its arable land through irrigation. The Green Revolution of the 60's was one of the reasons for reduced starvation in the country. However, the technologies we have used in Green Revolution to achieve this target are now being questioned.

- Our fertile soils are being exploited faster than they can recuperate.
- Forests, grasslands and wetlands have been converted to agricultural use, which has led to serious ecological problems.
- Our fish resources, both marine and inland, show evidence of exhaustion.
- There are great disparities in the availability of nutritious food across the country. Some communities such as tribal people are still malnourished due to lack of nutritious food especially among women and children.

These issues led to the question of meeting the increasing demands of food even with a slowing of population growth. Today the world is experiencing a changing trend in dietary habits. People have shifted to non vegetarian food as living standards are improving. As people change from eating grain to meat, the world's demand for feed for livestock based on agriculture increases as well. This uses more land per Chapter of food produced and the result is that the world's poor do not get enough food to eat.

Women play an extremely vital role in food production as well as cooking and feeding children. But, in most rural communities they have the least exposure to technical training and to issues related to nutritional aspects. Women and girls often receive less food than men. These disparities need immediate attention. In India, cultivable productive land is limited. Small farm sizes do not support a family on farm produce alone. With each generation, farms are being subdivided further. Poor environmental agricultural practices such as jhum cultivation, shifting cultivation, or 'rabi' (woodash) cultivation degrade forests. Globally 5 to 7 million hectares of farmland is degraded each year. Land degradation occurs due to loss of nutrients and overuse of chemicals for agricultural production. Water scarcity is another important aspect of poor agricultural outputs. Salinization and water logging have affected a large amount of agricultural land worldwide. Loss of genetic diversity in crop plants is another issue that is leading to a fall in agricultural produce. Rice, wheat and corn are the staple foods of two thirds of the world's people. As wild relatives of crop plants in the world's grasslands, wetlands and other natural habitats are being lost, the ability to enhance traits that are resistant to diseases, salinity, etc. is lost. Genetic engineering remains an untried and risky alternative to traditional cross breeding.

As per the estimates of Food and Agriculture Organization (FAO), about 840 million people around the world remain hungry and out of this 800 million are living in the developing world. In the last decade, there is a decreasing trend at the rate of 2.5 million per year, but world's population is increasing simultaneously. With the present trend, the target of cutting half the number of world's chronically hungry and undernourished people by 2015 could not be met. Due to sparse purchasing power of the poor to buy food, they are unable to maintain the minimum calorific requirement of human body per day. Since large numbers of people in India are poor there exists an equitable distribution of income. Food insufficiency can be divided into two categories undernourishment and malnourishment. Both insufficiencies are global problems.

### **Under Nourishment**

According to the estimates of FAO, globally the average minimum daily calorie intake is about 2,500 calories per day. People who receive less than 90% of their minimum dietary intake on a long term basis are considered undernourished. Those who receive less than 80% of their minimum daily calorie intake requirements are considered 'seriously' undernourished. Children who are seriously undernourished are at the receiving end and they are likely to suffer from multiple problems like stunted growth, mental retardation, and other social and developmental disorders. Therefore, undernourishment means lack of enough calories in available food, resulting in little or no ability to move or work.

### **Malnourishment**

Malnourishment occurs due to deficiency in nutrients in body. Though a person may have excess food, but still his/her diet suffers due to nutritional imbalance or inability to absorb the nutrients or may have a problem to utilize essential nutrients. If we compare the diet of people from developed countries with developing countries, people in developed countries have processed food which may be deficient in fibre, vitamins and other components whereas the diet of developing countries lack specific nutrients because of consumption of less meat, fruits and vegetables due to poor purchasing power. Malnourishment can be defined as lack of specific components of food such as proteins, vitamins, or essential chemical elements. The major problems of malnutrition are

**Marasmus** a progressive emaciation caused by lack of protein and calories.

**Kwashiorkor** lack of sufficient protein in the diet which leads to failure of neural development and therefore learning disabilities.

**Anaemia** it is caused by lack of iron in the diet or due to an inability to absorb iron from food.

**Pellagra** it occurs due to the deficiency of vitamins in the diet.

Every year, lack of food and problems associated with it kill as many people as were killed by the atomic bomb dropped in Hiroshima during World War II. This shows that there is a drastic need to increase food production, equitably distribute it and to control population growth. Although India is the third largest producer of staple crops, it is estimated that about 300 million Indians are still undernourished. India has only half as much land as USA, but it has nearly three times the population of USA to feed. Our food problems are directly related to population.

### **Balanced Diet**

Supply of adequate amount of different nutrients can help to improve malnutrition and its ill effects. Cereals like wheat and rice can supply only carbohydrates which are rich in energy supply but are only a fraction of nutritional requirement. Cereal diet must be supplemented with other foods that can supply fat, protein and minor quantities of minerals and vitamins. A balanced diet will help to improve growth and health.

### **Changes Caused by Agriculture and Overgrazing**

For centuries, agriculture is providing inputs to large number of industries involved in production, processing and distribution of food. Accordingly, agriculture has a significant effect on environment. The effects of agriculture on environment can be classified at local, regional, and global levels. Generally, agriculture makes impact on the usage of land as follows

- Deforestation
- Soil Erosion
- Depletion of nutrients
- Impact related to high yielding varieties (HYV)
- Fertilizers related problems including micronutrient imbalance, nitrite pollution and eutrophication.
- Pesticide related problems including creating resistance in pests and producing new pests, death of nontarget organisms, biological magnification.
- Some other problems like water logging, salinity problems and the like.

The carrying capacity of land for cattle depends upon microclimate and soil fertility. If carrying capacity is exceeded, then land is overgrazed. Because of overgrazing, the agricultural land gets affected as follows

- Reduction in growth and diversity of plant species
- Reduced plant cover leads to increased soil erosion
- Cattle trampling leads to land degradation

#### **To Do Activity**

Identify the main sources of food and the staple food consumed by the people in your area. Also make a note on the production, distribution and supply of food resources in your area.

### **3.3 Effects of Modern Agriculture**

For sustainable production modern techniques are used to enhance productivity of different cropping systems under different agro-economics. Adoption of modern agricultural practices has both positive and negative effects on environment. Effects of modern agriculture are briefly discussed under different heads as under.

#### **Soil Erosion**

Raindrops falling on bare soil result in one of the oldest and still most serious problem of agriculture, which is soil erosion. The history of soil erosion is one of devastation and it had greatly impacted civilization. Eroded fields show that we are a failure as stewards of land.

#### **Irrigation**

Adequate rainfall is essential for farming in arid and semiarid regions and it is never guaranteed for the dry land farmer. This makes irrigation indispensable for reliable production. Irrigation ensures enough water when needed and allows farmers to expand their acreage of suitable cropland. In fact, we rely heavily on crops from irrigated lands, and it is estimated that one third of the world's harvest come from 17% of cropland that is under irrigation. Unfortunately, current irrigation practices severely damage the cropland and the aquatic systems from which the water is withdrawn.

#### **Agriculture and the Loss of Genetic Diversity**

As modern agriculture converts an ever increasing portion of the earth's land surface to monoculture, the genetic and ecological diversity of the planet erodes. The factors that contribute to genetic erosion

include conversion of diverse natural ecosystems to new agricultural lands and the narrowing of the genetic diversity of crops.

### **Fertilizer Pesticide Problems**

For photosynthesis plants require water, sunshine and CO<sub>2</sub>. Apart from this, plants also need micro and macro nutrients for growth. These nutrients are supplied in the form of fertilizers. There is lot of potential to increase food productivity by increasing fertilizer use. On the one hand, application of artificial chemical fertilizers increases the productivity at a faster rate as compared to organic fertilizers, on the other hand, application of fertilizers can be a serious problem of pollution and can create a number of problems. Excessive level of nitrates in ground water has created problems in developed countries. These are

- Accumulated phosphorous because of the use of phosphoric fertilizers are posing serious threat as residues in domestic water supply and for ecology of river and other water bodies. Increased level of phosphates in different waters results in eutrophication.
- Effect of chemical fertilizer is long term, therefore leads to net loss of soil organic matter.

To control insects, pests, diseases and weeds which are responsible for reduction in productivity, different chemicals are used as insecticides, pesticides and herbicides. Successful control of insects, pests and weeds increases productivity and reduces losses and provide security for harvest and storage. Applications of these synthetic chemicals have great economic values and at the same time cause a number of serious problems such as

- Affects human health which includes acute poisoning and illness caused by higher doses and accidental exposures
- As long term effect, cause cancer, birth defects, Parkinson's disease and other regenerative diseases.
- Long term application of pesticides can affect soil fertility.
- Danger of killing beneficial predators.
- Pesticides resistance and pest resurgence

### **Water Logging**

High water table or surface flooding can cause water logging problems. Water logging may lead to poor crop productivity due to anaerobic condition created in the soil. In India, deltas of Ganga, Andaman and Nicobar Islands and some areas of Kerala are prone to frequent water logging.

### **Salinity**

Due to adoption of intensive agriculture practices and increased concentration of soluble salts leads to salinity. Due to poor drainage, dissolved salts accumulate on soil surface and affects soil fertility. Excess concentration of these salts may form a crust on the surface which may be injurious to the plants. The water absorption process is affected, and uptake of nutrient is disturbed. According to an estimate, in India, 7 million hectares of land is saline, and that area is showing increasing trends due to adoption of intensive agriculture practices.

### **Case Studies**

1. A study on birth defects in water birds in Kester son wildlife refuge in California indicated that these defects were due to high concentration of selenium.

2. Recent reports from cotton growing belt of Punjab which covers Abohar, Fazalka and part of Bathinda indicates that overuse of pesticides for control of insects in cotton to enhance productivity has not only affected soil health, but also caused cancer in human beings.

3. Diclofenac is a drug for veterinary use to treat the livestock which have strong residual nature and leads to high persistence throughout the food chain. Due to biomagnification it becomes more dangerous to the vultures as they are consumers of diclofenac treated cattle. Diclofenac is responsible for bringing three South Asian species of *Gyps* vultures to the brink of extinction. It has been banned in India since 2006.

#### **To Do Activity**

Observe how food is being wasted in your area or community, whether it is a marriage function or any other event. Also suggest some food conservation methods.

### **3.4 Food Security**

It is estimated that 18 million people worldwide and mainly children, die each year due to starvation or malnutrition, and many others suffer a variety of dietary deficiencies. The earth's supply of food is restricted. If the world's carrying capacity to produce food cannot meet the demands of a growing population, this might result in anarchy and conflict. Thus, food security and population control are directly connected. Food security is also linked to the availability of water for farming. Equitable distribution of food only can result in food security. Generally, people waste a large amount of food carelessly. This eventually places great stress on our environmental resources. One of the major concerns in this sector is the support needed for small farmers so that they remain farmers rather than shifting to urban centres as unskilled industrial workers. International trade policies regarding an improved flow of food across national borders from those who have surplus to those who have a deficit in the developing world is another issue that is a grave concern for planners who deal with International trade concerns. 'Dumping' of under priced foodstuffs produced in the developed world, onto markets in undeveloped countries undermines prices and forces farmers there to adopt unsustainable practices to compete in this field.

#### **Approaches to Sustainable Food Security in Developing Countries**

##### **Intensification of Agricultural Production**

The main ideal behind intensification of agricultural production is that better conditions extended for producers of food will jointly improve their livelihoods and reduce incentives for land clearing. For example, African farmers have traditionally followed shifting cultivation in response to population growth and declining soil fertility. This path of agricultural expansion is best suited to land abundant countries.

Ensuring enhanced food security through reserves of grains and foodstuffs is an approach taken mainly by governments. In this case the government buys grain from farmers in the postharvest season and stores it as a reserve to sell where and when food shortages occur. In practice, government storage programs are problematic due to inadequate infrastructure (i.e. lack of processing, storage and transport facilities). Government storage schemes also tend to discourage private sector provision of storage by undermining profitability of private efforts.

### **Food Aid**

Food aid is one of the main international safety nets for many low income countries. Food aid has been used for development purposes. The important role of food aid is to function as an instrument to offset food shortages in developing countries, especially where fluctuations in domestic food production threaten food security. In such settings internal mechanisms like providing grain stocks are expensive and cash reserves (to buy food imports) are often inadequate to bridge the food gap (Shapouri and Rosen, 2001). Food aid is expected to continue to play a crucial role in alleviating transitory shortages and emergencies for low income countries. However, this is a short term solution to solving the problems of food shortages and can be counterproductive by undermining incentives for local agricultural producers.

### **Food Import**

Governments in developing countries use food imports by importing food from developed countries or other external sources during food shortages in their countries. However, this has been a failure due to inadequate cash reserves with them to import food. In order to achieve this, developing countries should promote exports to raise cash. This can be done through promoting both agricultural and non-agricultural exports.

### **Livelihood Approach**

The livelihood approach puts emphasis on the development of livelihood strategies those supporting and boosting resources by developing or increasing incomes and assets through livelihood diversification (WFP 1998). This approach originates from the premise that in developing countries farmers mainly depend on agricultural production for food and income to meet other household requirements. The livelihood approach recognizes that households pursue a range of livelihood strategies through diversification of income sources or assets (natural, financial, social, human and physical capital). This approach also recognizes that household needs consist of more than food, vital non-food needs such as shelter, clothing and health compete with food needs in terms of household's resource allocation (Frankenberger, 1996).

The livelihood approach is said to be effective because it incorporates the present situation, the short term and the long-term perspective. The objective is not only to preserve current patterns of consumption, but also to avoid destruction or sacrificing future standards of living. The approach puts emphasis on the livelihood systems maintained by a range of on farm and off farm activities. Together these provide a variety of procurement strategies for food and cash (WFP, 1998). It provides a policy framework for policymaking process that explicitly recognizes that increased agricultural productivity is not the only solution. The answer lies in supporting the diversification of income sources and assets, as well as promoting investments and activities that help households to face shocks to their livelihoods and reduce risks.

### **Alternate Food Sources**

Food can be innovatively produced if we break out of the current agricultural patterns. This includes working on new avenues to produce food, such as using forests for their multiple nonwood forest products, which can be used for food if harvested sustainably. This includes fruits, mushrooms, sap, gum, etc. This takes time, as people must develop a taste for these new foods.

### **Case Study**

Israel began using drip irrigation system as it is short of water. With this technique, farmers have been able to improve the efficiency of irrigation by 95%. Over a 20-year period, Israel's food production doubled without an increase in the use of water for agriculture.

In India, some traditional communities in urban and semi urban towns used to grow their own vegetables in backyards on wastewater from their own homes. Calcutta releases its wastewater into surrounding lagoons in which fish are reared and the water is used for growing vegetables.

### **3.5 Fisheries Management**

Fish is an important protein food in many parts of the world, and this includes both marine and freshwater fish. Around the globe, the supply of food from fisheries has increased phenomenally between 1950 and 1990, and fish catch has shown a decline due to overfishing in several parts of the world. FAO reports in 1995 reveals that 44% of the world's fisheries are fully or heavily exploited, 16% are overexploited, 6% are depleted, and only 3% are gradually recovering. Canada had to virtually close down cod fishing in the 1990s due to depletion of fish reserves. Modern fishing technologies using mechanized trawlers and small meshed nets results in overexploitation, which is not sustainable. It is obvious that fish have to breed successfully and need time to grow if the yield has to be used sustainably. The worst hits are the small traditional fishermen who cannot compete with organized trawlers.

There is a large scope for the development of fisheries in our country because of large continental shelf of 20 lakh square kms, availability of sufficient fish in big lakes and rivers, oceanic currents and skilled fishermen. Marine fishing is done in seas and oceans and Inland fishing is carried out in lakes, rivers and reservoirs. More than 1800 distinct species of fish are known to exist in India. Four forms of fisheries exist in India, viz., marine fisheries, freshwater or inland fisheries, estuarine fisheries and the pearl fisheries.

It is estimated that marine fisheries accounts for about 63 per cent of the annual fish production. Major fishes are sardines, mackerel, prawns, clupeoids and silver bellies. About two fifths or 37 per cent of the country's total fish production comes from inland fisheries. Major fishes are catla, rohita, kalabasil, mringal and carp etc. More than nine-tenths or 97 percent of the country's total production of marine fish and more than three fourths or 77 per cent of inland water fish is raised in Kerala, Maharashtra, Tamil Nadu, West Bengal, Andhra Pradesh, Karnataka and Gujarat. Notably, all are coastal states.

#### **Fish and Other Marine Resources**

Fish is a cheap source of animal protein for our food. Fish production comprises the finned true fish as well as shellfish such as prawns and molluscs. There are mainly two methods of obtaining fish, viz., capture fishing and culture fishery. Fish obtained from natural resources is called capture fishing. Fish obtained by fish farming is called culture fishery. The water source for fishing can be either seawater or fresh water, such as in rivers and ponds. Fishing can thus be done both by capture and culture of fish in marine and freshwater ecosystems.

#### **Marine Fisheries**

India's marine fishery resources include 7500 km of coastline and the deep seas beyond it. Popular marine fish varieties include pomfret, mackerel, tuna, sardines and Bombay duck. Marine fish are



caught using many kinds of fishing nets from fishing boats. Yields are increased by locating large schools of fish in the open sea using satellites and echosounders.

Some marine fish of high economic value are also farmed in seawater. This includes finned fishes like mullets, bhetki, pearl spots, shellfish such as prawns, mussels and oysters as well as seaweed. Oysters are also cultivated for obtaining pearls. As the depletion of marine fish occurs, the demand for more fish can only be met by such culture fisheries, a practice called mari culture.

### **Inland Fisheries**

Fresh water resources of fisheries include canals, ponds, reservoirs and rivers. Brackish water resources, where seawater and fresh water mix together, such as estuaries and lagoons are also important fish reservoirs. Mostly capture fishing done in inland water bodies produces low yield. Most fish production from these resources is through aquaculture. Fish culture is also done in combination with a rice crop, and fish are grown in the water in the paddy field. More intensive fish farming can be done in composite fish culture systems. Both local and imported fish species are used in such systems.

In a composite fish culture system, a combination of five or six fish species of fish is used in a single fishpond. These species are selected in such a way that they have different types of food habits and they do not compete for food among them. As a result, the food available in all parts of the pond is used. As Catlas are surface feeders, Rohus feed in the middle zone of the pond, Mrigals and Common Carps are bottom feeders, and Grass Carps feed on the weeds, these species can use all the food in the pond without competing with each other. This increases the fish yield from the pond.

One of the problems with composite fish culture is that many of these fishes breed only during monsoon. Even if fish seed is collected from the wild, it can be mixed with that of other species as well. So, a major problem in fish farming is the lack of availability of good quality seed. To overcome this problem, fish in ponds is bred using hormonal stimulation. This has ensured the supply of pure fish seed in desired quantities.

### **Fisheries in India**

Fisheries in India are a very important economic activity and a flourishing sector with varied resources and potentials. But fisheries together with agriculture had been recognized as an important sector only after independence. India had achieved a 11fold increase in production in fisheries sector in just six decades, i.e. from 0.75 million tonnes in 1950-51 to 9.6 million tonnes during 2012–13. This means that India had reached a second position in global fish production after China with an average annual growth rate of over 4.5 percent over the years. Besides meeting the domestic needs, the dependence of over 14.5 million people on fisheries activities for their livelihood and foreign exchange earnings to the tune of US\$ 3.51 billion (2012–13) from fish and fisheries products justifies the importance of the sector on the country's economy and in livelihood security. India is also an important country that produces fish through aquaculture in the world. India is home to more than 10 percent of the global fish diversity. Presently, the country ranks second in the world in total fish production with an annual fish production of about 9.06 million metric tonnes.

Freshwater aquaculture contributes to over 95 percent of the total aquaculture production. The freshwater aquaculture includes the culture of carp fishes, catfishes (air breathing and nonair breathing), freshwater prawns, pangasius, and tilapia. In addition, in brackish water sector, the aquaculture includes culture of shrimp varieties namely, the native giant tiger prawn (*Penaeus*



monodon) and exotic whiteleg shrimp (*Penaeus vannamei*). Thus, the production of carp in freshwater and shrimps in brackishwater form the bulk of major areas of aquaculture activity. The three Indian major carps, namely catla (*Catla catla*), rohu (*Labeo rohita*) and mrigal (*Cirrhinus mrigala*) contribute the bulk of production to the extent of 70 to 75 percent of the total fresh water fish production, followed by silver carp, grass carp, common carp, catfishes forming a second important group contributing to the rest of 25 to 30 percent.

The technologies of induced carp breeding and polyculture in static ponds and tanks virtually revolutionized the freshwater aquaculture sector and turned the sector into a fast-growing commercial sector. The developmental support provided by the Indian Government through a network of Fish Farmers' Development Agencies and Brackish water Fish Farmers' Development Agencies and the research and development programmes of the Indian Council of Agricultural Research (ICAR) have been instrumental for this revolutionary development. Various state governments, a host of organizations and agencies like the Marine Products Export Development Authority, financial institutions, etc. have also contributed to this effect.

Culture for maricultural species has been initiated in our country. It is presently carried out to a limited extent for seaweeds and mussels as a commercial activity and it is extended to some fish species like seabass and cobia on an experimental basis to standardize the technology. This has led to sustainability of fisheries and the present concern is regarding species diversification because the country possesses several other endemic potential and cultivable medium and minor carp species having regional demand. Efforts are being made to standardize the technology of mass scale seed production of these species and their inclusion as a component of conventional carp polyculture, based on their regional importance. In addition, there is contribution from cold water fisheries. Though of high value, it is a low volume category with a projected volume of 1 percent. Important fishes of cold waters are mahaseer and schizothoracids which belongs to the indigenous species and trout's among the exotic varieties.

India's aquaculture production is classified into freshwater and brackish water production. There are 429 Fish Farmers Development Agencies (FFDA) and 39 Brackish water Fish Farmers Development Agencies (BFDAs) for promoting freshwater and coastal aquaculture. Some of the important species cultured in India includes the Indian major carps and shrimp. Besides these, ornamental fish culture and seaweed farming, are slowly gaining importance in the aquaculture scenario in the last few years as alternative livelihood supporting sectors as small-scale activities.

Aquaculture in India has evolved as a possible commercial farming practice. It emerged from the level of traditional backyard activity over last three decades with considerable diversification in terms of species and systems. Aquaculture is growing in India at an annual growth rate of 67 percent. The carp based freshwater aquaculture comprising the Indian major carps, such as, catla, rohu and mrigal, has been contributing over 90 percent of the aquaculture production and satisfies the domestic need. Though the shrimp based coastal aquaculture is comparatively less, it contributes to about 5 percent of the export earnings. Induced breeding of carps and catfishes, hatcheries for mass scale spawning, seed rearing and carp polyculture are some of the epoch making technologies guided by the freshwater aquaculture development. In recent years, aquaculture sector has shown extensive diversification with the adoption of other species such as catfishes and freshwater prawns, due to their higher market demand and economic values.

### Growth of India's Fisheries Sector

The growth of India's fisheries sector can be divided into three phases.

In the first phase (1950-1966), landings were mainly by non-mechanized traditional crafts and gears, such as hook and line, gillnets, seines, bag nets, and traps, from catamarans, canoes and plank built boats.

During the second phase (1967-1986), these vessels were modified to hold outboard engines of 59 HP (i.e., motorization), to travel farther and increase fishing effort.

In the third phase (1987 to 2010), significant endeavours were made to increase mechanization further and develop the industrial fishing sector. Vessels were equipped to engage in multiday voyages, and a large expansion of fishing grounds was observed.

Though mechanized fishing has increased, India's fisheries remain small-scale and difficult to categorize. The boundaries between subsistence (i.e., small-scale non-commercial) and artisanal (i.e., small-scale commercial) sectors in fishing are blurred. There are approximately 1.45 million fishers in India and the bulk of marine fish landed (about 70%) is being targeted by mechanized fishing vessels, which can be defined as industrial.

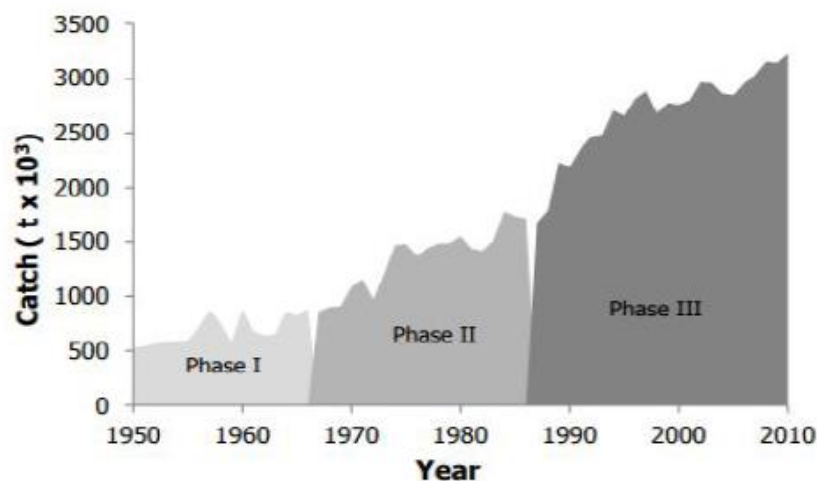


Figure 3.2 Growth of India's Fisheries Sector

### The Institutional Framework for Fisheries in India

The Ministry of Agriculture of the Government of India has a Department of Animal Husbandry, Dairying, and Fisheries with a Division of Fisheries as the nodal agency. This agency is responsible for planning, monitoring and the funding of several centrally sponsored developmental schemes related to fisheries and aquaculture in all the Indian States. Most of the states have a separate Ministry for Fisheries or else it remains within the Ministry of Animal Husbandry. All states have well organized fisheries departments, with fisheries executive officers at district level and fisheries extension officers at Chapter level, who are involved in the overall development of the sector. However, the administrative structure at state levels varies from state to state. Centrally sponsored schemes like the 422 FFDA cover almost all districts in the Country and the 39 BFDA in the maritime districts have also contributed to aquaculture development.

The Indian Council of Agricultural Research located within the Department of Agricultural Research and Education, which is within the Ministry of Agriculture, has a Division of Fisheries, which undertakes the R&D on aquaculture and fisheries through several research institutes. There are about 400 Krishi Vigyan Kendras (Farm Science Centres) in the country, operated through State Agricultural Universities, ICAR Research Institutes and NGOs, most of which also undertake aquaculture development within their scope of activities. The MPEDA functioning under the Ministry of Commerce, besides its role in the export of aquatic products also contributes towards the promotion of coastal aquaculture. Many other organizations and agencies also support or conduct R&D in fisheries and include the departments of Science and Technology, departments of Biotechnology, University Grants Commission, NGOs and private industry.

### **Blue Revolution**

The Honourable Prime Minister has called for “a revolution” in the fisheries sector and has named it as “Blue Revolution”. The Blue Revolution, with its multidimensional activities, focuses mainly on increasing fisheries production and productivity from aquaculture and fisheries resources, both inland and marine.

### **Objectives**

- To increase the overall fish production in a responsible and sustainable manner for economic prosperity
- To modernize the fisheries with special focus on new technologies
- To ensure food and nutritional security
- To generate employment and export earnings
- To ensure inclusive development and empower fishers and aquaculture farmers

The Ministry of Agriculture and Farmers Welfare, Department of Animal Husbandry, Dairying & Fisheries has accordingly restructured the scheme by merging all the ongoing schemes under an umbrella of Blue Revolution. The restructured scheme under Blue Revolution provides focused development and management of fisheries, covering inland fisheries, aquaculture, marine fisheries including deep sea fishing, maricultural and all activities undertaken by the National Fisheries Development Board (NFDB). The restructured Centrally Sponsored Scheme on Blue Revolution initiated Integrated Development and Management of Fisheries formulated at a total Central outlay of 3000 crores for five years with the following components

- a. National Fisheries Development Board (NFDB) and its activities
- b. Development of Inland Fisheries and Aquaculture
- c. Development of Marine Fisheries, Infrastructure and Postharvest Operations
- d. Strengthening of Database & Geographical Information System of the Fisheries Sector
- e. Institutional Arrangement for Fisheries Sector
- f. Monitoring, Control and Surveillance (MCS) and other need-based Interventions
- g. National Scheme of Welfare of Fishers

### **3.6 Issues and Challenges in Fisheries**

The central ethical issues in fisheries relate widely to human and ecosystem wellbeing. This section provides a short overview of some of the most important ethical issues poverty, the right to food, overfishing and ecosystem degradation. These sector specific issues comprise subsidiary issues. Example, the equity of fish distribution, the real or perceived dangers of genetic modification

(FAO/WHO, 2003); and the catching and discarding of unwanted species, including emblematic species.

Problems in this sector are compounded by contextual changes related to climate change and globalization. Globalization is a complex, multidimensional and pervasive process characterized by the increasing integration of economies around the world through trade and financial flows. It raises a number of ethical issues relating to (i) the risk of losing cultural identity and diversity in fishing communities (ii) the risk of further degradation of biodiversity and fishery resources (iii) the difficulty of trying to satisfy a broader range of stakeholders explicitly and (iv) the negative consequences on efforts to reduce poverty, increase food security and guarantee justice and social peace.

### **Poverty**

Fisheries constitute a major source of livelihood for millions of people. Nearly 35 million fishers are directly engaged in fishing and fish farming as a fulltime (i.e. where fishers receive 90 percent or more of their livelihood from fishing) or part-time occupation (FAO, 2002). Fishers are particularly concentrated in developing countries, where about 95 percent of the world's fishers live, and in Asia as a whole, where approximately 85 percent reside. Fisheries policies that weaken the economic foundations of fishers' communities will be more consequential in remote and rural areas of developing countries, because here people rely mostly on fisheries as their sole livelihood option and alternative sources of livelihood are rare.

In many highly populated Asian countries, artisanal fishing families are among the most socially, economically and politically disadvantaged segments of the population and maintain a status comparable to that of landless labourers or marginal farmers. Deprivation is so severe that the basic needs of life are hardly met at the minimum level necessary for survival. Malnutrition is common, infant mortality is high, and chronic sickness and disease result in very low life expectancies. Conditions are similar in several areas of Africa and Latin America. However, small scale fishing families are generally better off on these continents, even if the average income levels in small scale fisheries are often below the official poverty lines.

According to FAO estimates, the number of poor small-scale fishers and related employees in marine and inland capture fisheries is 5.8 million, representing 20 percent of the world's 29 million fishers. Small-scale fisheries often find themselves in growing competition with industrial fisheries for space, resources, inputs (labour and finances) and markets, with a strong impact on incomes distribution. The suppliers of fishing inputs may become better off, as may the consumers of fish. Small-scale fishers, on the other hand, may become increasingly uncompetitive and may eventually find their sources of livelihood severely compromised. In South and Southeast Asia, the fishing industry has been increasingly overtaken by large companies. As a result, fisheries employment opportunities have been shifted to urban areas, and opportunities in rural areas have declined, e.g. for the women who traditionally play important roles in processing, marketing and distributing the catch. This has resulted in a feeling of "hopelessness and despair or feelings of anger" among fishers, particularly small-scale fishers (Chong, 1994).

A renewed focus on the right to food has been one of the constructive responses to the state of poverty in the world. As a response to persistent and widespread hunger, the 1996 Rome Declaration on World Food Security and the World Food Summit Plan of Action reaffirmed the right of everyone to adequate food and the fundamental right to be free from hunger, as stated in the Universal

Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights of the Chaptered Nations General Assembly and in other relevant international and regional instruments. They urged that particular attention be paid to the implementation and full and progressive realization of these rights as a means of achieving food security for all. In 2002, FAO established an Intergovernmental Working Group for the elaboration of a set of guidelines on the right to food. In 2004, the FAO Council adopted the Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security.

Fish is a major source of both livelihood and nutrition for millions of the world's poorest people. In 2001, more than 48 percent of the world population (close to 3 billion people) obtained 1525 percent of their proteins from fisheries, and more than 400 million people received more than 50 percent of their proteins from fisheries (FAO, 2004). The latter include the poorest people in coastal rural areas and small island developing states for whom a decrease in fish catch often means an immediate loss in sources of food and calorie intake.

In many parts of the world, traditional ways of ensuring the right to adequate food have been affected and often undermined by the weakening of social and cultural ties, caused by the breakup of traditional family Chapters; accelerated urbanization; and the globalization of markets, information and culture. Technological developments, as well as changes in trade and markets, have radically altered, and internationalized many aspects of local fisheries. These changes have certainly resulted in economic benefits for a large number of people and, in some instances, in a more efficient use of the resource. But they have also brought about a shift from highly dispersed, largely rural, labour-intensive small-scale fishing operations to centralized, urban or peri urban, capital intensive industrial fisheries. This shift has also affected sectors such as fish processing, distribution and marketing and amplified negative consequences to employment, income and food security of the rural poor.

During the past two decades, technology and trade have not only altered many traditional forms of production, processing and distribution, but also created conflicts over resource access and use. The significant increase in the volume of international fish trade is a rising concern for poor people and the aquatic environment. The local level benefits in productivity and efficiency cannot solve the problem of the poor, instead they require significant improvements to governance, as well as trade and market policies. The changing state of fisheries resources, the economic climate and environmental conditions have resulted in fluctuations in fish supply and demand, but fisheries and aquaculture continue to be a significant source of food, employment and revenue for many countries and communities.

### **Overexploitation or Overfishing**

Overexploitation or overfishing is the removal of marine living resources to levels that cannot sustain viable populations. Ultimately, overexploitation can lead to depletion of resources and may lead to extinction of endangered species. A greater variety of species at a higher trophic level is exploited in the sea compared to land. Humans exploit over 400 species as food resources from the marine environment, whereas only ten species are harvested for commercial use on land. Exploitation of marine biodiversity is also far less managed than on land and amounts to the hunter gatherers stage that humans abandoned on land over 10,000 years ago, yet exploitation technology is becoming so advanced that many marine species are threatened to extinction. Insufficient consideration has been

given to the unexpected and unpredictable long-term effects that such primitive food gathering practices engender.

The overexploitation of marine living resources was due to the exponential growth in human population which had led to increasing demand for food. Today fishing fleets are two to three times larger than what our oceans can support. They exploit fish and many other marine species. The use of modern techniques that support harvesting, transport and storage has accelerated this trend. According to the Chaptered Nations Food and Agriculture Organization (FAO) over 25% of all the world's fish stocks are either overexploited or depleted and 52% are fully exploited. Thus, almost 80% of the world's fisheries are fully exploited, overexploited or depleted, or in a state of collapse. Recent studies show that 29% of fish and seafood species have collapsed (i.e., their catch has declined by 90%) and are projected to collapse within by 2048, if proper measures are not taken. Worldwide about 90% of the stocks of large predatory fish stocks have already collapsed.

Overexploitation affects both the open ocean or pelagic ecosystems and the coastal and intertidal areas. For example, intertidal limpets in Hawaii (*Cellanaspp.*), the Azores, Madeira and Canaries (*Patella spp.*) have shown decline, and particularly with Azores, there was a dramatic population crashes due to food gathering.

### **Overexploitation Effects**

Fishing activities in an unsustainable destructive manner can lead to overexploitation of marine living resources. This overexploitation of marine resources has huge impacts on marine systems and especially it affects target species. Fishing effect can be categorised into direct effects and indirect effects. Direct effects are related to target species and by catch species.

#### **Direct Effects**

When fishing of target species is relatively high, the average size of individual fish is affected because larger individual fish tend to be harvested more and it leads to overfishing. Due to exploitation of adult fish, the number and size of the adult population (spawning biomass) is reduced to a point that it does not possess the reproductive capacity to replenish itself, leading to recruitment overfishing. Direct effects of fishing also include physical disturbance by fishing gear than can cause scraping, scouring and resuspension of the substratum. The effects vary according to the gears used and the habitats fished. Trawling for demersal species is having a major effect on the habitat for species other than target species. It has been estimated that all the seabed of the North Sea is trawled over at least twice per year and the gear is getting heavier over time. Trawls have destroyed long-lived species of molluscs and echinoderms in the North Sea. It has far reaching consequences as these species play important roles in biogeochemical cycling.

#### **Indirect Effects**

Fishing also results in indirect effects such as effect of "ghost fishing", trophic cascading effects and food web competition. Trophic cascading effects has been observed when top-level predators are removed resulting in indirect effects throughout the ecosystem. On many temperate reefs shifts from macroalgae dominated habitats to habitats grazed by sea urchins, termed 'urchin barrens' are linked to the overharvesting of top predators. The best example of this is the interaction between sea otters, sea urchins and kelp. The importance of the sea otterurchinkelp trophic cascade was demonstrated after sea otters were wiped out by harvesting for their fur, allowing their prey, sea urchins, to

overgraze kelps and dominate many benthic ecosystems. After the repopulation of areas by otters, kelp and its associated communities became much more abundant.

**Ghost Fishing** is a phenomenon that occurs when fishing nets are left or lost in the ocean by fishermen. Often these nets are invisible in the dim light, it may be left entangled on a rocky reef or it might drift in the open sea. They can act as a trap to fish, dolphins, sea turtles, sharks, dugongs, crocodiles, seabirds, crabs, and other creatures, including the occasional human diver. If trapped in these nets, it may restrict movement of fish and other species and can cause starvation, laceration and infection and suffocation.

### **Overfishing and Ecosystem Degradation**

The decline in fish stocks due to overfishing is potentially dangerous and often a threat to life in the ocean. Biodiversity is threatened by unsustainable fisheries and increasing pollution. Entire ecosystems may be degraded, and even destroyed, by human intervention. Depletion of fish stocks leads to a host of problems like decrease in food supply from the sea, economic loss, hardship to fishers and disruption of traditional ways of life. Overfishing thus threatens the ecosystem, the sustainable use of fishing grounds and the livelihood of fishing communities.

FAO indicates that about 50 percent of global marine fisheries resources are fully exploited, 25 percent are overexploited, and about 25 percent could, as it seems, support higher rates of exploitation (FAO, 2005a). According to the National Marine Fisheries Service, 76 stocks were determined to be overfished in waters of the Chaptered States of America (NMFS, 2004). On a global level, in addition to what is harvested, during the past decade, over 7 million tonnes of fish about 8 percent of the global catch have been killed and discarded yearly by fishers using insufficiently selective gear (FAO, 2005b).

### **Unsustainable Harvesting**

Unsustainable fish harvesting are ways of catching wild fish that are not sustainable in the long term. This occurs due to various factors it could threaten the fish stock itself by overfishing, or they threaten the environment the fish need to thrive. In developing countries, dynamite fishing, electro fishing, or fishing with poisons are examples of methods that threaten the environment.

Unsustainable fishing methods in the Western countries include bottom trawling. According to leading marine environmentalists this results in 'great harm' to marine wealth. Illegal and unreported fishing contributes to the reduction in fish stocks and hurts the ability to help in recovery of the fish population. It is believed that 10 23 billion such incidences happen annually. Developing countries are more likely to be at risk for illegal activities. Although officials have tried to control the blast fishing, it is still practised in impoverished pockets in the world. The effects of the blast fishing are horrifying. The water is littered with dead fish or struggling fish.

In Africa, poor Tanzanian fishermen use explosives to kill hundreds of fish in a matter of minutes. It is believed that the fishermen are tossing explosives into the water around 10 times per day. Though a dangerous practice, fishermen continue this practice due to the profit they receive.

### **Conservation of Fisheries**

Marine conservation, also known as ocean conservation, is concerned with the study of marine plants and animal resources and ecosystem functions. It is the protection and preservation of ecosystems in oceans and seas through planned management in order to prevent the exploitation of these



resources. Due to the manifold negative effects of marine exploitation namely species loss, habitat degradation and changes in ecosystem, marine conservation is gaining popularity. It mainly focuses on limiting human caused damage to marine ecosystems, restoring damaged marine ecosystems, and preserving vulnerable species and ecosystems of the marine life. Marine conservation is a relatively new discipline which has developed as a response to biological issues such as extinction and marine habitats change.

A conventional idea of a sustainable fisheries one in which fish is harvested at a sustainable rate and the fish population does not decline over time because of fishing practices. Sustainability in fisheries includes the theoretical disciplines and practical strategies. Theoretical discipline involves the population dynamics of fisheries. Various practical strategies for sustainable fisheries encompasses practices such as avoiding overfishing through techniques such as individual fishing quotas, curtailing destructive and illegal fishing practices by lobbying for appropriate law and policy, setting up protected areas, restoring collapsed fisheries, incorporating all externalities involved in harvesting marine ecosystems into fishery economics, educating stakeholders and the wider public, and developing independent certification programs. Some primary concerns around sustainability are that heavy fishing pressures, such as overexploitation and growth or recruitment overfishing, will result in the loss of significant potential yield and the stock structure will erode to the point where it loses diversity and resilience to environmental fluctuations; that ecosystems and their economic infrastructures will cycle between collapse and recovery; with each cycle less productive than its predecessor; and that changes will occur in the trophic balance (fishing down marine food webs).

According to fisheries scientists and marine conservationists, sustainable management of fisheries can be achieved by considering that the long-term goals of fisheries management and environmental conservation are equally important. Global wild fisheries are believed to have peaked and begun a decline, which led our valuable habitats, such as estuaries and coral reefs, in critical condition. Current aquaculture or farming of piscivorous fish, such as salmon, does not solve the problem because farmed piscivores are fed products from wild fish, such as forage fish. Salmon farming also has major negative impacts on wild salmon. Fish that occupy the higher trophic levels are less efficient sources of food energy. Fishery ecosystems are an important subset of the wider marine environment.

### **Conservation Tools**

Conservation tools and techniques for preserving marine biodiversity conservation combines theoretical disciplines such as population and community marine biology, with practical conservation strategies, such as setting up marine reserves or marine protected areas (MPAs). Other techniques for conservation of fisheries comprise developing sustainable fisheries, which involves establishing fishing quotas and restoring the populations of endangered species through artificial means. Another focus of conservation effort is to halt human activities that are detrimental to the marine environment through policies or legislations, at an international, European and/or regional level. Education of the general public about conservation issues is crucial for the conservation of the marine environment. There are many marine conservation organisations throughout the world that focus on funding conservation efforts, educating the public and stakeholders, and lobbying for conservation law and policy.



## Marine Reserves and Marine Protected Areas

Less than 1% of the earth's oceans are protected compared to 12% of the land surface. Highly protected marine reserves are areas of the sea where human disturbances are minimised, thus allowing to maintain the natural biodiversity and helps to recover it to a more natural state. In Europe there are very few marine reserves, they are small and are found in the Mediterranean. While, there are many Marine Protected Areas (MPAs) in Europe, these areas only have some extra regulations or planning procedures, but they do not fully protect marine biodiversity. Inside marine reserves all extractive and potentially disturbing human activities are prohibited. Marine reserves are extremely important to science and education, essential for conservation, useful in resource management and necessary for reversing the effects of overexploitation. The benefits of marine reserves in New Zealand

### To Do Activity

Make a complete report of the various species of fish and other marine food species available in India.

where twenty marine reserves have been created over the last 25 years is notable. For example, inside marine reserves the abundance of species of ecological and commercial importance, such as the snapper *Pagurus auratus* and the spiny lobster *Jasusedwardsii* have increased almost 9 and 4 times compared to the adjacent unprotected areas. Furthermore, the mean body size of these animals is significantly large inside reserves than in outside. This shows an urgent need for a representative, replicated, networked and sustainable system of highly protected Marine Reserves.

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# Chapter 4 Land Resources Management

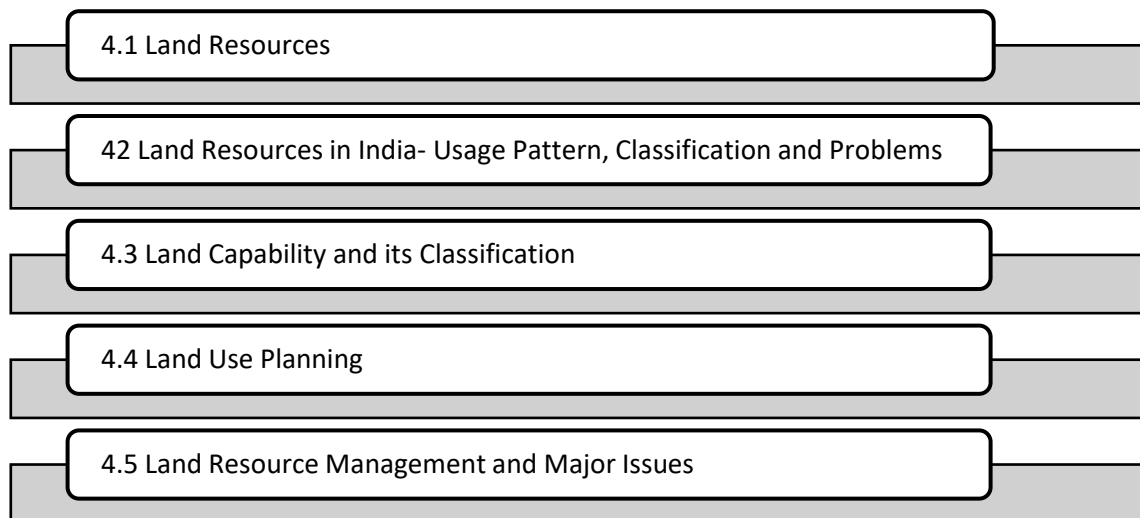
## Introduction

You must have observed that the land around you is put to different uses. Some land is occupied by rivers, some may have trees, and roads and buildings have been built on some parts. Different types of lands are suited for different uses. Land is used as a resource for production as well as residence and recreation by human beings. Thus, the building of your institution, the roads on which you travel, parks in which you play, fields in which crops are grown and the pastures where animals graze represent different uses to which land is put. This Chapter defines, explains and considers the dimensions of land resources management.

## Objectives

- To explain about land as a resource, classification, associated problems and methods of conservation.
- To explain about land resources in India
- To understand land capability and its classification
- To give an in depth understanding of land resource management and its major issues

## Structure



## 4.1 Land as a Resource

Land area constitutes about 1/5<sup>th</sup> of the earth's surface. Efficient management of land resources is crucial to meet the challenging demand of food, fibre and fuel for human population as well as fodder for animals and industrial raw material for agro based industries. Soil, water, vegetation and climate are the basic natural resources for agricultural growth and development.

People live in different landforms such as hills, valleys, plains, river basins and wetlands. These landforms are resource generating areas and the people living in these areas depend on them for their livelihood. Many traditional farming societies had different ways of preserving areas from which they used resources. E.g. In the 'sacred groves' of the Western Ghats, simple rituals were conducted as

requests to the spirit of the Grove for permission to cut a tree or extract a resource. The outcome of a chance fall on one side or the other of a stone balanced on a rock gave or withheld permission.

The request could not be repeated for a specified period. If land is utilized carefully it can be considered a renewable resource. The roots of trees and grasses bind the soil. If forests are depleted, or grasslands overgrazed, the land becomes unproductive and wasteland is formed. Intensive irrigation leads to water logging and salination, on which crops cannot grow. Due to the dumping of highly toxic industrial and nuclear wastes, land is converted into a non renewable resource.

Land on earth is as finite as any other natural resources. While mankind has learnt to adapt his lifestyle to various ecosystems world over, he cannot live comfortably on polar ice caps, or under the sea, or in space in the foreseeable future.

Man needs land for building homes, cultivating food, maintaining pastures for domestic animals, developing industries to provide goods, and supporting the industry by creating towns and cities. Equally importantly, man needs to protect wilderness area in forests, grasslands, wetlands, mountains, coasts, etc. to protect our vitally valuable biodiversity.

Thus, a careful planning is essential for rational use of land. One can develop most of these different types of land uses almost anywhere, but Protected Areas (National Parks and Wildlife Sanctuaries) can only be situated where some of the natural ecosystems are still undisturbed. These Protected Areas are important aspects of good land use planning.

#### Land Resource Classification

Land is one of the most important natural resources. Land supports our life system. Thus, careful planning of use of land resource is necessary. India comprises of many types of land. These are mountains, plateaus, plains and islands.

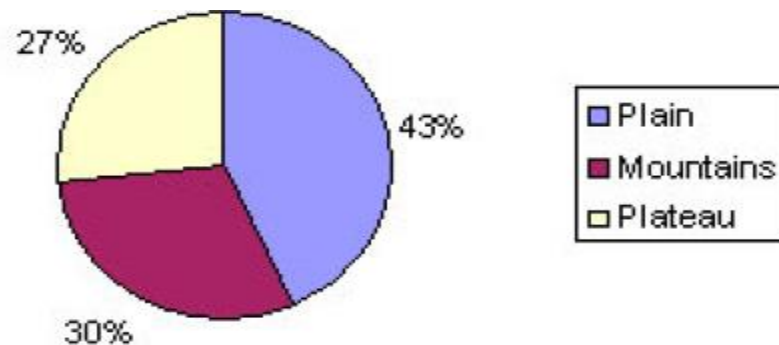


Figure 4.1 Land Resources in India

(Source [https://www.google.co.in/search?q=land+resources+in+india&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjH48uzlZHjAhXMdCsKHYtDBsQQ\\_AUIECgB&biw=1366&bih=651#imgrc=lk3fAhIqFn1MGM](https://www.google.co.in/search?q=land+resources+in+india&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjH48uzlZHjAhXMdCsKHYtDBsQQ_AUIECgB&biw=1366&bih=651#imgrc=lk3fAhIqFn1MGM))

**Mountains** About 30% of land area in India is in the form of mountains. Mountains support the perennial flow of rivers, which carry fertile soils, facilitate irrigation and provide drinking water.

**Plains** About 43% of land area in India is in the form of plains. Plains provide facilities for agriculture, building of industries and houses, etc.

**Plateaus** About 27% of land in India is in the form of plateaus which provides many types of minerals, fossil fuels and forest.

**Land not available for cultivation** There are two types of land which are not used for agriculture purpose. These are

- Barren and waste land
- Lands used for buildings, roads, factories, etc. i.e. for non-agricultural purpose.

**Other uncultivated land (excluding fallow land)**

- Permanent pastures and grazing land
- Land under miscellaneous tree crops groves (not included in net sown area)
- Cultivable waste land (left uncultivated for more than 5 agricultural years)
- Fallow lands
- Current fallow land (left without cultivation for one or less than one agricultural year)
- Other than current fallow land (left uncultivated for the past 1 to 5 agricultural years)
- Net sown area (area which is sown at least once in a year)
- Gross cropped area (area sown more than once in an agricultural year plus net sown area)

**Problems Associated with Land resources**

**Land Degradation**

Due to increasing population, the demands for arable land for producing food, fibre and fuel wood is also increasing. Hence there is more and more pressure on the limited land resources, and it is getting degraded due to overexploitation.



Nearly 56% of total geographical area of the country is suffering due to land resource degradation. Out of 17 million hectares of canal irrigated area, 3.4 million hectares is suffering from water logging and salinity. Soil erosion, water logging, salinization and contamination of the soil with industrial wastes like flyash, press mud or heavy metals cause degradation of land.

Farmland is under threat due to intense utilisation of land. Every year, between 5 to 7 million hectares of land worldwide is added to the existing degraded farmland. When soil is used more intensively by farming, it is eroded more rapidly by wind and rain. Overirrigating farmland leads to salinization, as evaporation of water brings the salts to the surface of the soil on which crops cannot grow. Over irrigation also creates water logging of the topsoil so that crop roots are affected, and the crop deteriorates. The extensive use of chemical fertilizers poisons the soil so that eventually the land becomes unproductive. As urban centres grow and industrial expansion occurs, the agricultural land and forests shrink. This is a serious loss and has long term ill effects on human civilisation.

### **Soil Erosion**

Soil erosion is defined as the loss or removal of superficial layer of soil due to wind, water and human factors. In other words, it can be defined as the movement of soil components, especially surface litter and topsoil from one place to another. It has been estimated that more than 5000 million tonnes topsoil is being eroded annually and 30% of total eroded mass is getting loosed to the sea. It ultimately results in the loss of fertility. Soil erosion is basically of two types, viz. geologic erosion and accelerated erosion. Various factors which affect soil erosions include soil type, vegetation cover, slope of ground, soil mismanagement and intensity and amount of rainfall. Wind is also responsible for the land erosion through saltation, suspension and surface creep.

In order to prevent soil erosion and conserve the soil the following conservation practices are followed. It includes Conservational till farming, Contour farming and Terracing Strip cropping and alley cropping, Wind breaks or shelterbelts.

The characteristics of natural ecosystems such as forests and grasslands depend on the type of soil. Soils of various types support a wide variety of crops. The misuse of an ecosystem results in loss of valuable soil through erosion by the monsoon rains and, to a smaller extent, by wind. The roots of the trees in the forest hold the soil. Deforestation thus leads to rapid soil erosion. Soil is washed into streams and is transported into rivers and finally lost to the sea. The process is more evident in areas where deforestation has led to erosion on steep hill slopes as in the Himalayas and in the Western Ghats. These areas are called 'ecologically sensitive areas' or ESAs. To prevent the loss of millions of tons of valuable soil every year, it is essential to preserve what remains of our natural forest cover. It is equally important to reforest denuded areas.





The linkage between the existence of forests and the presence of soil is greater than the forest's physical soil binding function alone. The soil is enriched by the leaf litter of the forest. This detritus is broken down by soil microorganisms, fungi, worms and insects, which help to recycle nutrients in the system. Further losses of our soil wealth will impoverish our country and reduces its capacity to grow enough food in future.

### **Salinization**

It refers to accumulation of soluble salts in the soil. Concentration of soluble salts increases due to poor drainage facilities. In dry land areas, salt concentration increases where poor drainage is accompanied by high temperature. High concentration of salts affects the process of water absorption hence affects the productivity.



### **Water Logging**

Excessive utilization of irrigation may disturb the water balance which can lead to waterlogging due to rise of water table. Anaerobic condition due to poor availability of oxygen in waterlogged soils may affect respiration process in plants which will ultimately affect the productivity of waterlogged soil.



### **Desertification**

Desertification is a process whereby the productive potential of arid or semiarid lands falls by ten percent or more. Desertification is characterized by devegetation and depletion of groundwater, salinization and severe soil erosion.

### **Causes of desertification**

- Deforestation
- Overgrazing
- Mining and quarrying

### **Shifting Cultivation**

Shifting cultivation is a practice of slash and burn agriculture adopted by tribal communities and is a main cause for soil degradation particularly tropical and subtropical regions. Shifting cultivation which is also popularly known as 'Jhum Cultivation' has led to destruction of forest in hilly areas. It is responsible for soil erosion and other problems related to land degradation in mountainous areas.





### **Man Induced Landslides**

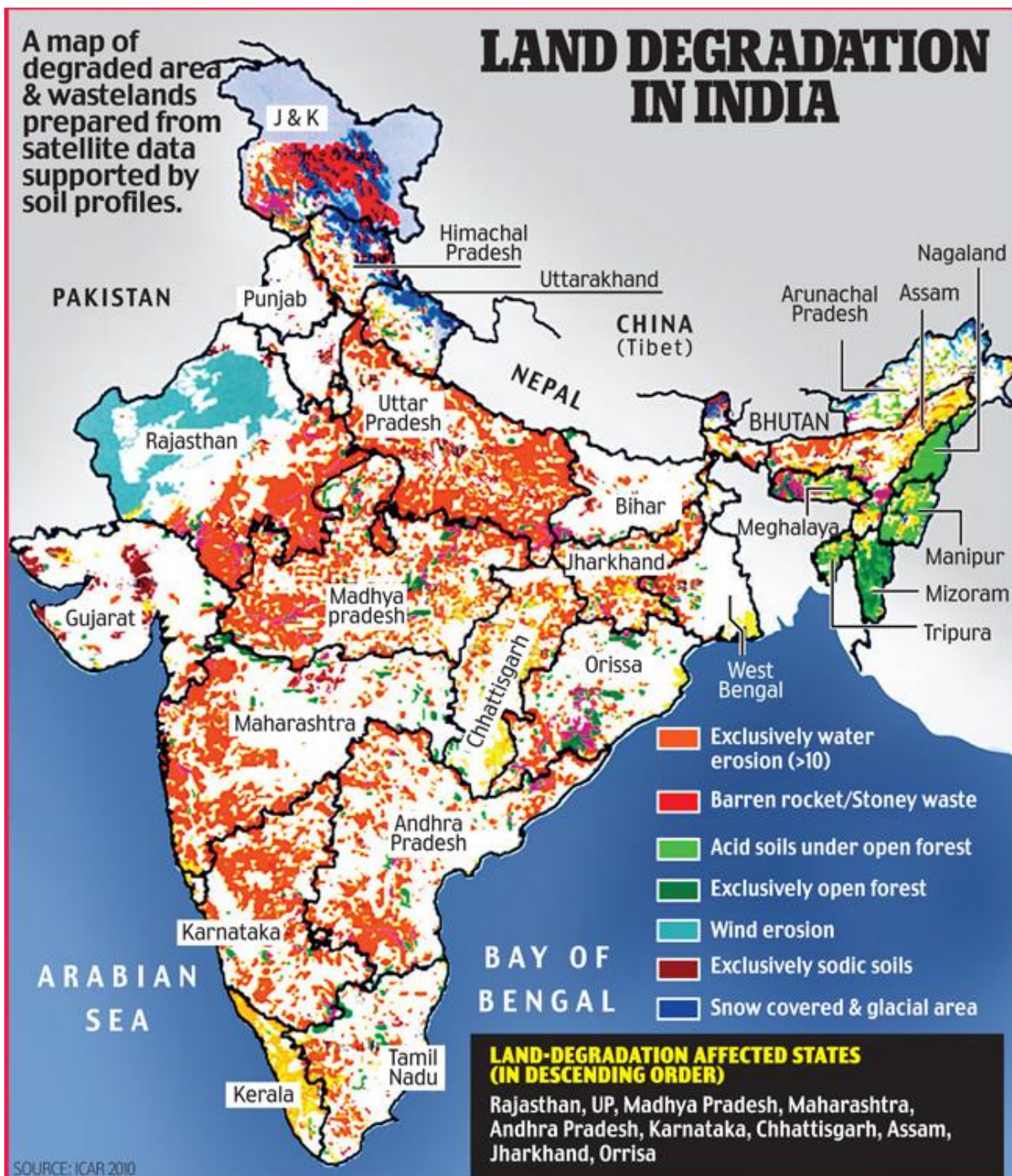
Human race has exploited land resources for their own comfort by constructing roads, railway tracks, canals for irrigation, hydroelectric projects, large dams and reservoirs and mining in hilly areas. Moreover, productive lands under crop production are decreasing because of development activities. These factors are affecting the stability of hill slopes and damage the protective vegetation cover. These activities are also responsible to upset the balance of nature and making such areas prone to landslides.

### **Case Study**

#### **Selenium – Punjab**

In 1981, farmers from Hoshiarpur and Nawanshahr districts approached scientists of the Punjab Agricultural University (PAU), Ludhiana, as wheat crops had turned white. Soil analysis indicated that selenium (Se) levels in the area were above toxic limits. Selenium is a naturally occurring trace element, essential for animal and human health, but the gap between requirement and excess is narrow. Soils containing 0.5 micrograms ( $\mu\text{g}$ ) of Se per kg or more are injurious to health. In some areas of Punjab, Se levels range from 0.31  $\mu\text{g}/\text{kg}$  to 4.55  $\mu\text{g}/\text{kg}$ . Rice cultivation requires the presence of standing water. Being highly soluble, Se dissolves and comes to the surface. The water then evaporates leaving the Se behind.





**Figure 4.2 – Land Degradation in India**

(Source [https://www.google.co.in/search?biw=1366&bih=651&tbm=isch&sa=1&ei=vqsYXcTjBsahyAPt i7Mw&q=land+degradation+in+India&oq=land+degradation+in+India&gs\\_l=img.12..0j0i5i30j0i8i30j0 i24i5.979988.986399..988545...0.0..0.156.3568.0j28.....0....1..gswizimg.....0i7i30j0i67j0i7i5i30j0i8 i7i30.WT\\_fLY7jZo#imgrc=6BhZgQLnnEsIM](https://www.google.co.in/search?biw=1366&bih=651&tbm=isch&sa=1&ei=vqsYXcTjBsahyAPt i7Mw&q=land+degradation+in+India&oq=land+degradation+in+India&gs_l=img.12..0j0i5i30j0i8i30j0 i24i5.979988.986399..988545...0.0..0.156.3568.0j28.....0....1..gswizimg.....0i7i30j0i67j0i7i5i30j0i8 i7i30.WT_fLY7jZo#imgrc=6BhZgQLnnEsIM))

**Methods for Conserving Our Land Resources**

According to Natural Resources Management Division, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, we can conserve our land resources by adopting the following measures

1. By educating, informing and sensitizing all landholders about various aspects of this precious resources and their sustainable use.
2. Contour ploughing is another measure to conserve our land. By this method, the fields are ploughed, harrowed and sown along the natural contour of the hills.
3. By terracing method, A series of wide steps are made along the slope following the contours. This method is very common in rice growing regions.
4. Under the afforestation and reforestation programmes, planting of trees, bushes and grass help to check the soil erosion.
5. Strict actions are taken to check reckless felling of trees and overgrazing.
6. Shelter belts (rows of trees) are planted on the margins of desert areas to check the fury of wind.
7. Construction of dams and gully trap inculcate the water harvesting.

#### **To Do Activity**

Write a detailed note on various forms of land (mountains, plateaus, plains) – their advantages and disadvantages.

## **4.2 Land Resources in India – Usage pattern, Classification and Problems**

1.3 million square miles of India's area is a peninsula jutting into the Indian Ocean between the Arabian Sea on the west and the Bay of Bengal on the east. In a country like ours, though plenty of land terrain is available, both food production and the realty market are exerting pressure on the land. Land is a non-renewable energy reserve and it is related to a variety of other elements such as availability of water, agrarian structure of the rural and urban economy, etc. Increasing population demands rapid urban development and increased land use. This leads to increased economic growth in selected landscapes especially in India and other developing countries.

Effective land management is possible by continuous monitoring of land use changes to understand land use over different temporal spatial time scales. Today, with rapid urbanization and industrialization, there is increasing pressure on land, water and environment, particularly in the big metropolitan cities. Land resource is further linked to urban sprawl. In order to utilize available land resources in India effectively, the country is streamlining efforts in the areas of land resource management. As result, we see a rise in the number of land resource companies, groups and other service providers across the nation.

# LAND RESOURCES IN INDIA



(Source [https://www.google.co.in/search?biw=1366&bih=651&tbm=isch&sa=1&ei=nK8YXdaCGMeP9QPcmpmgCw&q=land+resources+in+India&oq=land+resources+in+India&gs\\_l=img.12..0j0i24l6.994272.998931..1001190...0.0..0.206.2747.0j19j1.....0....1..gws wizimg.....0i7i30j0i7i5i30j0i8i7i30.gIAFLmFdHoA#imgrc=GORCO7MeTocmSM](https://www.google.co.in/search?biw=1366&bih=651&tbm=isch&sa=1&ei=nK8YXdaCGMeP9QPcmpmgCw&q=land+resources+in+India&oq=land+resources+in+India&gs_l=img.12..0j0i24l6.994272.998931..1001190...0.0..0.206.2747.0j19j1.....0....1..gws wizimg.....0i7i30j0i7i5i30j0i8i7i30.gIAFLmFdHoA#imgrc=GORCO7MeTocmSM))

## Land Use Pattern in India

Pattern of land use in India depends on both physical and human factors. Climate, topography, type of soil, etc. are considered as physical factors while population, technology, skill, population density, tradition, capability, etc. are considered as human factors. India has a total 3.28 million square kilometre land, but only 93% of land of total geographical area is available for use. This is because land used data has not been collected for the north eastern states except Assam and the land occupied by Pakistan and China has not been surveyed because of many unavoidable reasons. The land under permanent pasture is decreasing which creates the problem for grazing. The total net sown area (NSA) is not more than 54% including land other than fallow land. Land other than fallow land is either of poor quality or too costly to cultivate, these lands are cultivated only once or twice in two or three consecutive years. The pattern of net sown area varies widely from state to state. Where net sown area is 80% in state like Punjab, it is only 10% in the state of Arunachal Pradesh, Mizoram, Manipur and Andaman and Nicobar Islands. Such difference is creating lot of discrimination.

According to National Forest Policy (1952), the forests should be 33% of total geographical area, which is essential to maintain ecological balance. But the forest area in India is far less than desired measures. This is because of illegal deforestation and development such as construction of roads and building, etc. On the other hand, a large population which is dwelling at the fringe of forests depends



upon the forest and its produce, resulting in the reduction of forest area. Continuous use of land over a long period without proper conservation and management degrade them. This has resulted in repercussions in society and creates serious environmental problems.

### **Land Use Classification**

The land use categories according to the Land Revenue Records are as follows

**(i) Forests** It is important to note that area under actual forest cover is different from area classified as forest. The latter is the area which the Government has identified and demarcated for forest growth. The land revenue records are consistent with the latter definition. Thus, there may be an increase in this category without any increase in the actual forest cover.

**(ii) Land put to Non agricultural Uses** Land under settlements (rural and urban), infrastructure (roads, canals, etc.), industries, shops, etc. are included in this category. An expansion in the secondary and tertiary activities would lead to an increase in this category of land use.

**(iii) Barren and Wastelands** The land which may be classified as wasteland such as barren hilly terrains, desert lands, ravines, etc. normally cannot be brought under cultivation with the available technology.

**(iv) Area under Permanent Pastures and Grazing Lands** Most of this type of land is owned by the village 'Panchayat' or the Government. Only a small proportion of this land is privately owned. The land owned by the village panchayat comes under 'Common Property Resources'.

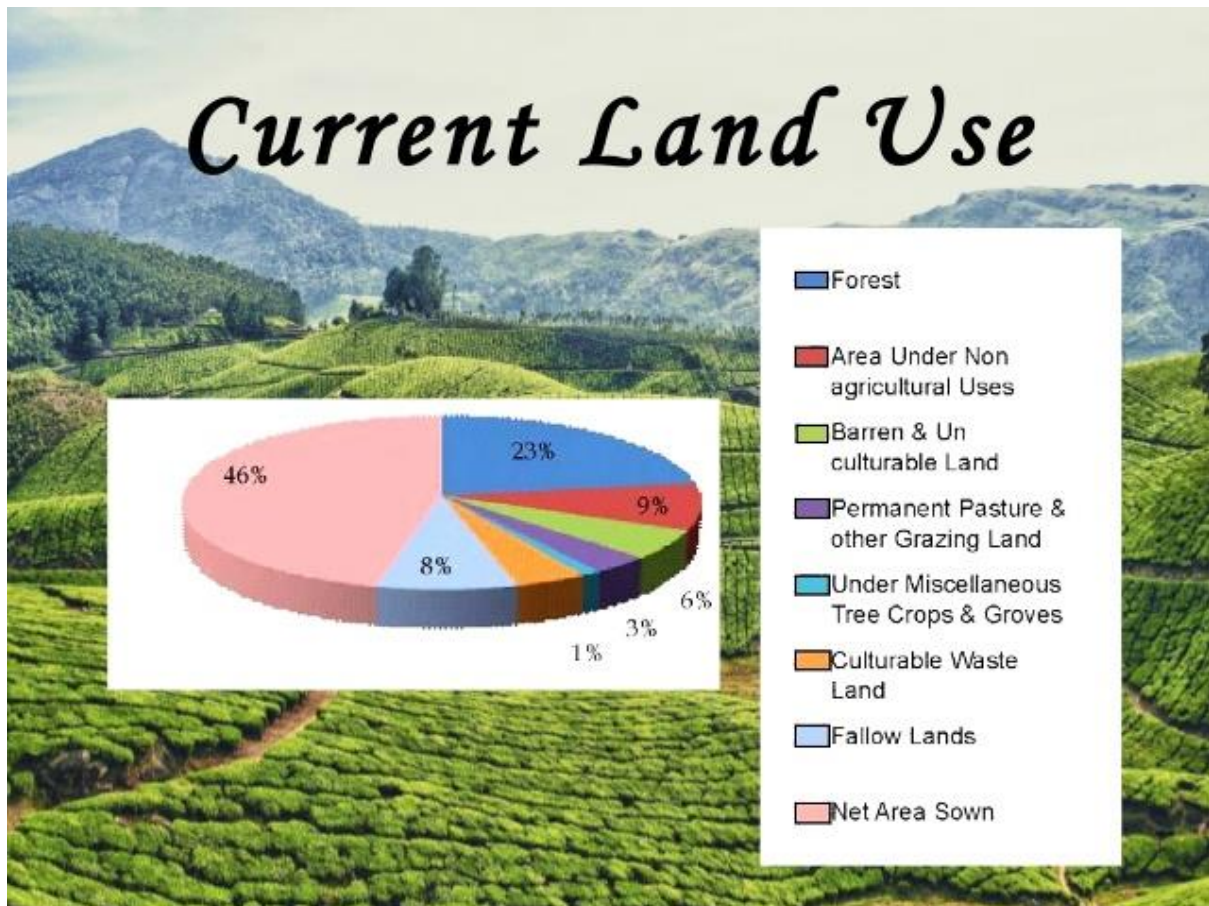
**(v) Area under Miscellaneous Tree Crops and Groves (Net sown Area is not included)** The land under orchards and fruit trees are included in this category. Much of this land is privately owned.

**(vi) Cultivable Wasteland** Any land which is left fallow (uncultivated) for more than five years is included in this category. It can be brought under cultivation after improving it through reclamation practices.

**(vii) Current Fallow** This is the land which is left without cultivation for one or less than one agricultural year. Following is a cultural practice adopted for giving the land rest. The land recoups the lost fertility through natural processes.

**(viii) Fallow other than Current Fallow** This is also a cultivable land which is left uncultivated for more than a year but less than five years. If the land is left uncultivated for more than five years, it would be categorised as cultivable wasteland.

**(ix) Net Area Sown** The physical extent of land on which crops are sown and harvested is known as net sown area.



**Figure 4.3 Land Use Classifications in India**

### Land Resource Problems in India

Our past generation left land for us without exploiting them too much and it is expected that we conserve it. We fulfil most of our needs from the land. It includes food, clothing, shelter, drinking water, etc. But the past few decades saw intense degradation of the quality of land by humans. Many human activities aggravated the natural forces responsible for degrading the land resources. Presently, about 130 million hectares of land is reported under degraded land in India, in which about 28% of land belongs to forests and about 28% is water eroded area. The other reasons for degradation of land are over deposition of salinity and alkalinity. Overgrazing, mining, deforestation, division of lands in small area because of family feuds, etc. are some of the major causes of degradation of land. Mining in the states of Jharkhand, Chhattisgarh, Odisha and Madhya Pradesh led to abandoned lands without proper treatment after the completion of mining works. This has resulted in the form of deep scars and traces. Along with mining, deforestation also led to land degradation in these states. In the states of Uttar Pradesh, Punjab, Haryana, over irrigation causes water shortage resulting in increase in salinity and alkalinity due to water logging. In Bihar, Assam and Arunachal Pradesh, land degradation occurs due to flood.

States, in which minerals are processed such as grinding of limestone, manufacturing of cement, etc. produce huge quantity of dust. These dusts prevent the percolation of water to the ground due to deposition on the ground and it leads to land degradation. The degradation of land causes many problems such as flood, decrease in yield, etc. which leads to decrease in GDP which ultimately leads to economic problems in our country.

## Dry Land

Land resources in India include vast barren lands. They are mostly found in states like Rajasthan. Parts of Leh and Jammu also has barren lands as snowfall prevents any major cultivation here. Real estate lands are growing at an incredible rate in India. Due to increasing mobility of people because of transferable jobs, the demand for more houses and apartments has grown in India. Havelis in Rajasthan is becoming more expensive with passing years. There is a strong competition among people in acquiring the best of farmlands, as they can be nestled in the best place replete with nature's gift.

### To Do Activity

Mark the distribution of wastelands on the Indian map and write a note about them.

## 4.3 Land Capability and its Classification

Land capability plays a vital role in deciding the land use. In this lesson, we shall discuss on land capability and its classification.

### Definition of Land Capability

Land capability may be defined as the ability of the land surface to support natural plant growth/ wildlife habitat or artificial crop growth/ human habitat. Thus, it indicates the type of land use [viz., human habitation, agriculture, pastures, forests, wildlife habitat, etc.] that is suitable over a particular type of land. Different lands have different capabilities depending on the land characteristics like slope, soil type, soil depth and erosion conditions. If certain land characteristics are not conducive for agriculture, it is desirable to utilize or ensure the continuity of that land area for other land uses as mentioned earlier. The ultimate goal of allocation of various land capabilities over a vast land area with varied characteristics is to achieve complete soil conservation. Complete soil conservation implies perfect soil health and zero soil erosion on a sustained basis. It also facilitates total water conservation and total vegetation conservation. Thereby it results in integrated watershed management on a long term basis.

In the next section, we shall discuss the classification of land capability based on the land characteristics. This land capability classification should ensure appropriate land use for every land area for peaceful coexistence of different flora and fauna including human habitation and also a sustained productivity through human activities.

### Classification of Land Capability

The Soil Conservation Service (SCS) of the United States Department of Agriculture (USDA) has done a pioneering work on land capability classification [Kingfield and Montgomery, 1961]. According to that, the land capability is classified broadly into two groups based on the cultivability of the land. The first group consists of all the lands which are suitable for cultivation and is referred to as 'Group 1 Lands'. The remaining group consists of all the lands which are unsuitable for cultivation which is referred to as 'Group 2 Lands'. Each of these two groups are further classified into four classes. Thus 'Group 1 Lands' comprise 'Land Classes I to IV' which are cultivable and 'Group 2 Lands' comprise 'Land Classes V to VIII' which are non culturable.

The following paragraphs describe each of the two groups and eight land classes in terms of their land characteristics and land use.

### **Group 1 Lands Generally Suitable for Cultivation**

**Class I Lands** These lands are nearly level with slopes generally within 1%. The soils are deep, fertile, easily workable and are not subjected to damaging overflows. There are hardly any restrictions or limitations for their use. These lands are very good lands which can be safely cultivated by using any farming method to grow any crop, even intensively also. However, proper crop rotation and green manure use should be followed to maintain soil fertility [Mal, 1994].

**Class II Lands** These lands generally have gentle slope in the range of 1 to 3%. They can be easily cultivated with some conservation practices like contour farming, strip cropping, bund construction or terracing. Therefore, one or more of the following limitations exist which slightly reduce the crop choice [Murthy and Jha, 2011].

1. Moderate susceptibility to erosion by wind or water
2. Less than ideal soil depth
3. Somewhat unfavourable soil structure and workability
4. Slight to moderate salinity
5. Occasionally damaging overflows
6. Wetness existing permanently which can be corrected by drainage
7. Slight climatic limitations on land use and management

**Class III Lands** These lands generally have slopes in the range of 3 to 5% and therefore have severe limitations which further reduce the crop choice or require special conservation practices [like contour farming, strip cropping, cover cropping, bund construction or terracing] or both. Lands in this class have more restrictions than those in Class II Lands due to land characteristics. All the limitations of Class II Lands are applicable here to a greater extent. Hay or pasture crops that completely cover the soil should be preferred. On wetlands of this Class which usually have heavy and slowly permeable soils, a drainage system along with a suitable cropping plan to improve the soil structure is required.

**Class IV Lands** These lands have good soils [i. e., having shallow soil depth and low fertility] and generally have somewhat steep slopes in the range of 5 to 8%. Therefore, they have either very severe limitations that largely restrict the crop choice or require very careful management or both. Lands may be suitable only for two to three common crops which build and maintain soil like the fully covering pastures, with occasional grain crops which can be grown usually once in five years. These lands may have one or more of the following permanent features [Murthy and Jha, 2011].

1. Heavy susceptibility for erosion due to wind, water with severe effects of past erosion
2. Low moisture holding capacity
3. Frequent overflows accompanied by severe crop damage
4. Water logging, excessive wetness and severe salinity
5. Moderately adverse climate.

**Land Capability Subclasses** Lands in Classes II, III and IV are further categorised into subclasses based on the following limitations

1. Risk of erosion or past erosion damage is designated by the symbol 'e'
2. Wetness damage or overflow is designated by the symbol 'w'
3. Soil root zone limitations are denoted by 's'
4. Climatic limitations are designated by 'c'



## Group 2 Lands Generally Not Suitable for Cultivation

**Class V Lands** These lands generally have slopes in the range of 8 to 12%. They usually have no to little erosion hazard but have other limitations which restrict their use mainly to pastures, forests, wildlife food and cover. Controlled grazing may be permitted. Some of the examples of Class V Lands are

1. Bottom lands which is subject to frequent overflows that prevent the normal production of cultivated crops
2. Stony or rocky lands
3. Few ponded areas where soils are suitable for grasses or trees.

**Class VI Lands** The lands in this Class have shallow soils and generally have quite steep slopes ranging to 18%. They have severe limitations which restrict their use to pastures with very limited grazing, woodlands, wildlife food and cover. Some of the limitations of these lands which can't be corrected are

1. Severe erosion
2. Stony texture with shallow rocks
3. Excessive wetness or overflow
4. Low moisture capacity
5. Severe climate.

**Class VII Lands** The lands in this Class are generally eroded, rough, having shallow soil depth and steeper slopes ranging to 25%. The soils may be swampy or drought prone, with all the limitations of Class VI Lands even to a higher degree. If there is good rainfall, they may be used for forestry with full green cover, gully control structures and severely restricted grazing.

**Class VIII Lands** These lands are rough with probably the worst soil types and possibly the steepest slopes in excess of 25%. They can only be used with very sound gully control measures for forests –if conducive for tree growth, and for wildlife habitat. However, tree felling, and grazing should be strictly avoided. Certain lands in Group 2 can be made cultivable with major earthmoving or other effective and costly reclamation operations. In India, both the Class VII Lands and Class VIII Lands are combined as Class VII Lands.

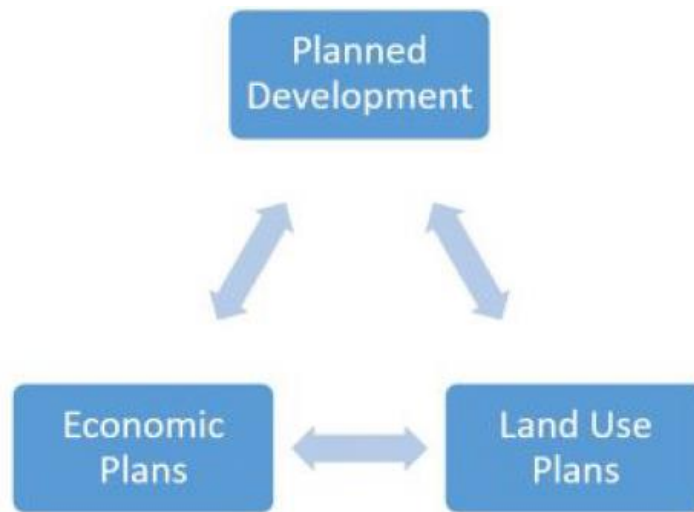
### To Do Activity

What are the laws regulating land governance in India? Write a brief note about them.

## 4.4 Land Use Planning

Every country requires development in all forms and various methods like economic planning, spatial planning or/and any other suitable planning are adopted for this purpose. Land use planning in India came with the emergence of the need for the planned development of towns and cities. Before independence, the population and the resource availability had a good ratio and the need for planning was not much required. But with the passage of time, there was unprecedented growth in population which had deteriorated the conditions of urban areas. This led to greater need for planned development. Before independence, due to the development of towns and cities various types of cities emerged. The type of the city was predominantly governed by their locations which played an important role in their function. For example, port cities were located on coastal areas and trade through sea route took place in these cities. Development and more importantly “planned development” are possible by efficient use of available resources like land, air, water, soil, forests and

other natural resources. For achieving efficiency and increasing output land use planning in India gained importance.



**Figure 4.4 Land Use Planning**

### **The Emergence of Town Planning or City Planning**

The evolution of planning started in the form of Improvement trusts which were assigned the responsibility of checking health issues. There were several improvement trusts which existed, and their administrative boundaries defined the area under their jurisdiction. After some time along with the improvement trusts, municipalities were also established. The concept of assigning activities to a particular parcel of land took its basic form in working with these improvement trusts and municipalities. They prepared both theoretical or sector plans and spatial plans for various uses. Property tax or similar tax was collected based on maps which had boundaries shown along with the plot number; this was considered as the primary form of spatial planning.

### **Evolution of Development Authorities**

As the cities grew in size and population, they faced more complex functioning. This increased complexity required a unique/ designated body to look after its development. In small cities and towns where development authorities are absent, many of the work is still under municipalities. On the other hand, the process of urban development was given to development authorities in the case of large cities. These development authorities used various ways to govern and plan for development and monitoring. The method for administering growth included preparation of development plan (master plan/zonal plan/sector plan/sub zonal plan/ layout plan/ local area plan etc.) and Town Planning Schemes (T.P. Scheme). All plans depended on the state government as land is a state subject under the Indian constitution.

### **Current Land Use Planning in India**

Town or urban planning in India is relatively new. The importance of planning is increasingly becoming popular as people are exploring ways for a better quality of life. Planning in India is done in various ways which included Economic Plans in the form of Five-Year Plans by Planning Commission which was renamed as NITI Aayog in 2015 which gives a sectoral allocation of money which will be spent in different sectors. Urban planning in India is done through various types of development plans. One such plan is a master plan which is made for urban areas which govern the growth of the urban areas.

Other popular plans include Town Planning Scheme or TP Scheme which is widely adopted in Gujarat. The most important feature of all development plans dealing with spatial planning is land use planning. Land use planning in India is followed for all development purposes. One of the most essential parts of any spatial plan includes a land use plan which assigns a plan of its spatial nature. The planning done is called land use planning as it involves assigning the particular activity to a given parcel of land.

### **Importance of Land Use Planning in India**

India is a developing country and a large population is still engaged in agricultural activity. However, there is a remarkable increase in GDP. Rapid urbanization in India pushes people to migrate to cities for various reasons like better job opportunities, health and educational facilities, better quality of life and to enjoy urban amenities. This largely unplanned urbanization has forced India to use its land resources more carefully. Strain over the land is increasing due to rapid increase in population in urban areas. Farming in urban areas is becoming impossible as it is land intensive and because of this, they rely on the surrounding regions to meet its requirement. Varied activities that occur in cities need proper management.

Land use planning in India manages various activities taking place in different areas. The activities are managed based on a master plan which governs the development of urban areas. Only those activities which conform to the given master plan are allowed in those areas. This helps in avoiding conflict in activities and thus reduces the negative impacts of different activities. For example, industries are not allowed near the residential area to reduce the negative health impact. This management is also done using zoning which involves segregating different activities in different places.

### **Colour Coding for Land Use Planning**

Land use planning in India is done by employing colour codes in the development plans. Different colours are assigned in the master plan or TP scheme which indicates a particular land use. Different colours indicate different categories like residential, recreational, commercial, transportation, industrial, public and semi-public on the map. Throughout India uniform colours are used for land use with the exception for the commercial and public & semi-public spaces. The colour coding differs in some states which include the use of red colour to indicate commercial areas and blue colour for public & semi-public land use while the vice versa is followed in most other parts. So, it is advisable to refer to the document/act which applies to the area if there is any confusion about the colour coding before working. Residential areas are shown with yellow colour in almost all areas in India and green colour is used for recreational areas.

## **4.5 Land Resource Management and Major Issues**

Land resource management is the process of managing the use and development (in both urban and rural settings) of land resources. Land resources are used for a variety of purposes which may include organic agriculture, reforestation, water resource management and ecotourism projects. Land management can have positive or negative effects on the terrestrial ecosystems. Land which is over or misused can degrade and reduce productivity and disrupt natural equilibriums.

Land resources in India enclose approximately 1.3 million square miles and is a cape, protruding into the Indian Ocean, in between the Bay of Bengal on the east and Arabian Sea on the west. Indian land resources are segmented into varied relief features, 43% of land area is plain region; Indian mountain region constitutes 30% of the area, whereas plateaus account for 27 % of the total surface area on the

nation. Despite sufficient accessibility of landed topography, population pressure in the country is excessive and that makes space for both food production and the real estate market. Land resources in India are at shortage in the present days. Land resources in India are considered as non renewable energy reserve. Further, they are associated with a host of several other elements such as agrarian base of rural as well as urban economy, accessibility of water, and other factors. India has seen rapid urban expansion and rising land usages. It is due to the increasing population growth and economic development in some selected landscapes. The monitoring of land use changes is essential to understand land use over different sequential or spatial time scales for successful land management.

Today, with increasing urbanisation as well as industrialisation, an increased pressure has been witnessed on land, water and other environment resources, mainly in big metropolitan cities. In order to utilise available land resources in India effectively, the country is reorganising efforts in the areas of land resource management. Thus, there has been a growth in land resource companies as well as in other service providers across the country. India occupies a land area of around 3,287,263 sq. km. There are different types of land in India, of which 54.7 % of it is civilised land. The different types of land resources in India include agricultural land, farmland, barren land, real estate land, commercial land and residential land. Majority of the population of India are engaged in agricultural and allied activities and thus agricultural land accounts for about 56.78 % of the total land area of the country. In India, the total cultivable area is 1,269,219 sq. km. Moreover, land is also used in India for grazing and as permanent pastures.

The trend of love for nature and no availability of space in city apartments is increasing and farm land is fast becoming the best option for land resources in India. Thus, land resources in India are crucial factors dealt by the Indian government and managed effectively according to the requirements. In order to make appropriate utilisation of obtainable land resources, the nation is making efforts to manage land resources effectively. Thus, there has been an increase in the number of land resource companies and service providers.

### **Sustainable Land Management**

Sustainable land management means managing land without damaging ecological processes or reducing biological diversity. It requires the maintenance of the following key components of the environment biodiversity the variety of species, populations, habitats and ecosystems; ecological integrity the general health and resilience of natural life-support systems, including their ability to assimilate wastes and withstand stresses such as climate change and ozone depletion; and natural capital the stock of productive soil, fresh water, forests, clean air, ocean, and other renewable resources that underpin the survival, health and prosperity of human communities.

Land is often managed for varied benefits, such as agricultural production, biodiversity conservation, water quality, soil health and supporting human life. To ensure long-term sustainability, land managers need to consider economic, social and environmental factors. Sustainable land management (SLM) in agriculture is a very complex and challenging concept. It encompasses biophysical, socioeconomic and environmental concerns that must be viewed in integrated manner.

An international Framework for Evaluating Sustainable Land Management (FESLM) was recently developed to provide a base for addressing these issues comprehensively. SLM combines technologies, policies and activities aimed at integrating socioeconomic principles with environmental concerns so as to simultaneously satisfy the five pillars of SLM

- Maintain or enhance production services (productivity)
- Reduce the level of production risk (security)
- Protect the potential of natural resources and prevent degradation of soil and water quality (protection)
- Be economically viable (viability)
- Be socially acceptable (acceptability)

“Land resources management is the implementation of land use planning, as agreed between and with the direct participation of stakeholders. It is achieved through political decisions; legal, administrative and institutional execution; demarcation on the ground; inspection and control of adherence to the decisions; solving of land tenure issues; settling of water rights; issuing of concessions for plant and animal extraction (timber, fuel wood, charcoal and peat, non-wood products, hunting); promotion of the role of women and other disadvantaged groups in agriculture and rural development in the area, and the safeguarding of traditional rights of early indigenous peoples.” (UNCED, 1993).

#### **To Do Activity**

Identify various approaches to ecology-based land management strategies or land conservation strategies and briefly explain about each of them.

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# Chapter 5 An Introduction to Livelihood

## Introduction

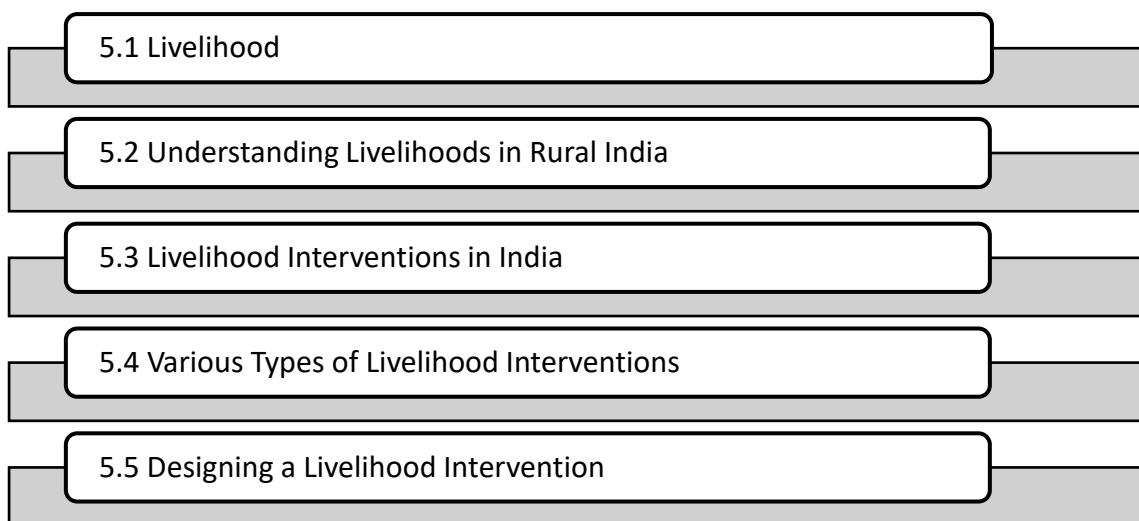
In the present-day context of a changing economic scenario, there exists an increasing population pressure on resources and hence, the livelihoods of the people, especially the poor, has emerged as an important challenge for us. Over the years, many institutions, government and nongovernment have made several attempts to address this issue. Some of these efforts have been in terms of actions or interventions, while others have tried to change the context within which the livelihoods are embedded.

This Chapter, therefore, defines, explains and considers the dimensions of Livelihood management.

## Objectives

- To explain about Livelihood, Need of Livelihood Promotion and Sustainable Livelihood
- To understand Livelihoods in Rural India
- To understand Livelihood Interventions and approaches
- To give an in depth understanding of designing a Livelihood Intervention

## Structure



## 5.1 Livelihood

Livelihood is defined as a set of economic activities, involving self employment and/or wage employment by using one's endowments (human and material) to generate adequate resources (cash and noncash) for meeting the requirements of self and the household, usually carried out repeatedly and as such become a way of life. Ideally, a livelihood should keep a person meaningfully occupied in a sustainable manner with dignity. Livelihoods are therefore more than generating income and much more than employment. Less than 10 percent of rural workers in India are employed on a regular basis. Poor rural households engage in more than one activity for their livelihoods.

Livelihood refers to people, their capabilities, their assets, their income and the activities needed to sustain a means of living, including ways of obtaining food. Therefore, understanding livelihood is crucial to comprehending nutrition in emergencies. It is through livelihoods that people obtain food and income security. Food and income security ensure that nutritional needs can be met. While nutritional status is a key outcome of how we analyse and respond to support livelihoods, adequate nutritional status is a key contributor to successful livelihoods.

Different phenomena, including globalisation, climate change, urbanization and conflict, can impact on the success or failure of livelihood strategies. These phenomena have the potential to weaken livelihoods making households more vulnerable to food and income insecurity.

### **Need for Livelihood Promotion**

According to estimates of the Planning Commission for the Tenth Five Year Plan, more than 10 million people in India will be seeking work every year. Thus, to ensure full employment within a decade, more than 10 million new livelihoods will have to be generated every year. Given the magnitude of the problem, and the dearth of resources for livelihood promotion, the task of promoting livelihoods for the poor becomes even more compelling. It calls for organizations to use their resources optimally to achieve maximum scale.

The primary reason to promote livelihoods is the belief in the essential right of all human beings to equal opportunity. Poor people do not have life choices, nor do they have opportunities. Ensuring that a poor household with a stable livelihood will substantially increase its income, and over a period of time, asset ownership, self-esteem and social participation.

The second reason for livelihood promotion is to promote economic growth. The ‘bottom of the pyramid’ comprising nearly 4 billion out of the 6 billion people in the world do not have the purchasing power to buy even the bare necessities of life – food, clothing and shelter. But as they get consistent incomes through livelihood promotion, they become customers of many goods and services, which then promote growth. The third reason for promoting livelihoods is to ensure social and political stability. When people are hungry, they take to violence and crime.

Thus, we see that there are idealistic, utilitarian and self-interest based arguments for livelihood promotion.

### **Sustainable Livelihood**

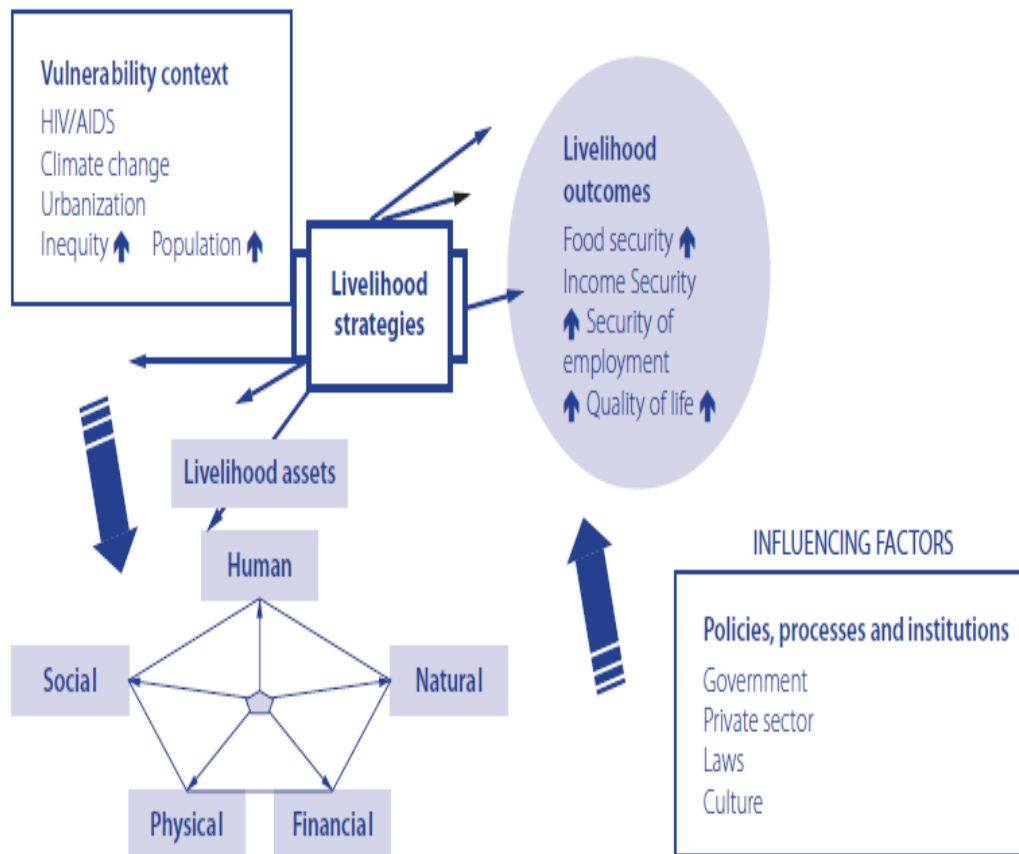
A livelihoods framework can be used to analyse situations where some form of intervention may be necessary. The approach involves considering where people are, what they have, and what are their needs and interests. A common livelihoods framework that is used to determine the appropriate livelihoods programming is the ‘sustainable livelihoods framework’.

The main elements of a sustainable livelihoods’ framework are

- **Vulnerability Context** the structural and underlying causes of people’s vulnerability to food and livelihood insecurity can include poverty, chronic food insecurity, a high prevalence of HIV and AIDS and a lack of basic services.
- **Policies, Institutions and Processes** constitutes the governance environment, including government and nongovernmental organizations (NGOs), and the private sector, as well as processes such as laws, policies, culture or customary practices, markets and institutions.



- **Livelihoods Assets** what people have, including social (status in society, extended family) and human (labour) assets, as well as financial (cash, credit, savings, investments) and physical assets (livestock, houses).
- **Livelihoods Strategies** what people do (agriculture, wage labour) and the practical means or activities through which people access food and income.
- **Livelihoods Outcomes** the goals that people are pursuing, the 'living' that results from their activities.



**Figure 5.1 Sustainable livelihoods framework**

**To Do Activity**

Visit a village or assume a village and write all the possible livelihoods of the families there. Classify them into farm, on farm, off farm and nonfarm.

**5.2 Understanding Livelihoods in Rural India**

Rural areas are those areas that do not have modern facilities and the population is much lower than in cities. Livelihoods mean the type of jobs and lifestyles people undertake to earn a living.

**Types of Rural Livelihoods**

**1] Agriculture Labourers**

Agriculture labourers are daily wage earners who work as labourers in the fields. They comprise two thirds of the total rural population in India. These labourers do not own land of their own and are

forced to work in the lands of rich farmers. Some labourers own a small piece of land which does not support the family. These workers are exploited by rich farmers, as they don't have any alternative ways to earn money and they come in plenty as 'cheap labour' for the fields.

## **2] Farmers**

Farmers are a group that consists of villagers who carry out farming activities in their own lands. They sow seeds, weed and harvest crops and reap the product themselves. However, eighty percent of these farmers also have very small land holdings and need to depend on other sources of income like having a poultry or dairy business. To earn enough money to barely survive, these farmers borrow money from money lenders for seeds, fertilisers, etc., and are at great risk of being in debt. This leads to farmer suicides in our country.

## **3] Farmers with other Sources of Income**

The farmers who do not earn enough from their land or by working on other rich farmers' lands need other sources of income. They work in mills near the farms or sell milk of the cows that they own. Selling other byproducts like sap, collecting wood, leaves of certain plants, fruits, etc., helps them to sustain and survive. Some farmers also seasonally go to the cities or towns to work as wage earners as there is more opportunity to earn money in cities.

## **4] Rich Farmers and Landowners**

The rich farmers are in a very small percentage in rural areas. They own most of the land and hire agricultural labourers to work for them. They are also the exploitative village money lenders and generally own the nearby mills and small factories.

## **5] Other Service Providers**

In villages, apart from labourers, farmers and landlords, there are also people who provide basic services. Barbers, nurses, village teachers, etc., are small professionals who are found in villages. Some of them are self-employed and some are employed under government schools or hospitals.

## **The Importance of Rural Livelihoods**

Between one quarter and one fifth of the world's population derive their livelihood from small-scale agriculture. Most of these people are members of peasant farm households or are dependent upon the activities of peasant farm households. The large number of rural people and their involvement in agriculture and other activities makes the understanding of rural people, peasants, and their livelihoods important for many reasons.

In global terms, poverty is predominantly a rural phenomenon (as noted earlier although there are large and increasing numbers of urban poor people, a greater proportion of poor people in the world live in rural areas and poverty tends to be more severe in rural areas). Many of the rural poor depend directly or indirectly upon peasant livelihoods. Peasant agriculture is significant in both national economies and the world economy in terms of

- its contribution to production of livestock and of food, beverage and industrial crops
- its effect on the environment and scarce natural resources (peasant agriculture is an important form of land use often found in marginal areas where land is vulnerable to degradation and subject to competing uses and other natural resources, such as water, may be scarce)

Poor rural people's livelihoods are significant in national economies and the world economy in terms of

- the potential market for increased demand for consumer goods and services if rural people become more wealthy
- their potential contribution to, or drain on, resources either as a dynamic and growing part of national economies generating employment, tax revenues, and so on, or as a stagnant sector demanding welfare support for a poor and large part of the population

Understanding these livelihoods is therefore important for our understanding of rural poverty, the resulting human suffering, and the pressures it then places on urban areas (through rural–urban migration, national, regional, and global economies, and the environment) and to address these issues.

The average Indian feels compassion for these rural folks and find ways to improve their quality of life and to extend their control over their environments, resources, and destinies. However, if we are to assist them (as policymakers, researchers or community development workers), we must understand both their environments and their behaviour within those environments. This is necessary for communication and partnership. It is also needed for analysis of what they are doing and why, for identification of strategies for improvement, and for prediction of their responses to change.

### **Structural Characteristics of Rural Livelihoods**

The livelihoods and characteristics of poor rural people and peasants are similar. These people engage in part time farming activities with a mode of agricultural production distinct from that of other farms (such as commercial, smallholder family or cooperative farms) with multiple economic activities which are predominantly in small scale (often household) activities and enterprises in the informal economy. These activities depend on family labour and use meagre capital. The distinctive features of poor rural people's activities require separate analysis as it is distinct from commercial agricultural or non-agricultural enterprises in the formal sector.

- Partial integration into imperfect and incomplete markets
- Part societies with part cultures
- Transition
- Subordination
- Small scale agriculture using family labour
- Multiactivity livelihoods
- Dual economic nature
- Heterogeneity

### **Diversity**

Diversification is a process (if planned) of growing new crop varieties, value crops, small enterprises, casual labour etc where economic status of household could improve. Diversification implies increased output from manufacturing (value addition) and services sectors and visible declining share from primary activities (e.g. traditional cultivation). Diverse livelihoods imply a person relying on different, multiple activities within a year. They could be

- Land based and nonland based activities

- Self-employment or labour
- Rural employment or outmigration (temporary)

### **Diversification and Specialization**

As local economy keeps changing, individuals may become specialized in new sectors. For example, a *darji* could open a cloth store, a traditional carpenter opening a furniture store etc. In some cases, such changes could occur without changes in the local economy. This is out of individuals' needs, aspirations and conditions that exist at local level. Various *paan shops* on roadside in villages are examples of this type of diversification. Lack of capital and skills restricts some families to retain or modify the traditional livelihoods.

If the new economic activities provide higher returns than a traditional activity, it is called 'pull' or 'positive' diversification. As a result, the household accumulates assets, live better. If new options provide lower returns than usual, they are termed as coping strategies in response to shock. This is called 'push' or negative diversification. As a result, the household get pushed in impoverishment cycle.

### **Differences in Access, Opportunities and Market Returns**

Those at the bottom of the wealth, caste and class system have little other than their own labour, and they are generally unskilled and asset less. Thus, poor people are being trapped by their lack of assets in low return activities which continue to prevent them from accessing the assets to escape poverty. Even when the poor participate in activities and markets, they face unfavourable conditions. Economic poverty and political disadvantage gandingan and gets poor share in policy entitlements.

### **Causes of Livelihood Change and Exclusion**

In Andhra Pradesh and Madhya Pradesh both poor and well-off farmers practice sharecropping, agriculture labour and borrowing. But the better-off households can access high return productive land, well paid labour opportunities and much more likely to get formal sector credit at modest rates of interest. In contrast, the poor access only low return land, gets low paid jobs, and invariably relies for credit on moneylenders or large farmers charging higher interest rates. As poor have no savings to fall back on, they are often forced to enter markets at the least favourable times (selling crops immediately after harvest when prices are low). They also pay more for services such as credit and get lower returns (in sharecropping). Powerful patron can be helpful in times of shock but also set exploitative terms in several markets credit, land and labour. The policy challenge was to establish forms of representation or awareness that increase the political negotiating ability for the marginalised.

#### **To Do Activity**

Visit a rural place, understand the realities of livelihoods. For this, you can either choose your livelihoods or livelihoods of any of your family member or your friend's livelihoods.

### **5.3 Livelihood Interventions in India**

Livelihood interventions are conscious efforts by an agency or an organization to promote and support livelihood opportunities for many people (other than those directly or indirectly employed by them). Government of India has been one of the largest agencies involved in such livelihood promotion

efforts. However, the cooperative sector, the corporate sector and many NGOs has also contributed to promoting livelihoods.

### Examples

- Government program for development of irrigation. India has added over 40 million hectares of irrigation since independence, largest in human history. This has generated or stabilized the livelihoods of millions of people.
- In agriculture, the predominant livelihood interventions covered irrigation through large dams and canal systems till the 1960s, followed by the introduction of the high yielding varieties package during the Green Revolution, impacting the livelihoods of over 40 million farmers and a similar number of landless laborers.
- Government programs such as the National Rural Employment Program (NREP), refashioned as the Sampoorna Gram Samridhi Yojana (SGSY), to guarantee wage employment to the poor in the lean season through public works such as road building. Part of the wages are paid in kind as food grains, which is a carryover from the erstwhile “food for work” program.
- Government programs such as the erstwhile Integrated Rural Development Program (IRDP), refashioned as the Swarna Jayanti Grameen Swarozgar Yojana (SGSY), to promote self-employment among the poor through acquisition of an income generating asset with the help of a bank loan and a government subsidy.
- Special government programs, run in specific states, to promote both wage employment, such as the Employment Guarantee Scheme (EGS) of Maharashtra and to promote self-employment through highly subsidised asset acquisition, such as the World Bank sponsored District Poverty Initiatives Program (DPIP) in AP, MP and Rajasthan.
- Programs run by sectoral institutions such as the National Dairy Development Board, the Central Silk Board, the Coir Board, the National Horticultural Board, and the Development Commissioners for Handloom and Handicrafts.
- Programs run by nongovernmental agencies, for promoting livelihoods in different regions and sectors, such as by SEWA, BAIF, MYRADA, AKRSP, PRADAN, RGVN and BASIX.
- The Self-employed Women’s Association (SEWA) works with over 750,000 self-employed women of low income households.
- Bhartiya Agroindustry Foundation’s (BAIF) program supporting one million livelihoods, comprising cattle crossbreeding, pasture development, horticulture, etc.
- Venkateshwara Hatcheries intervention to develop the poultry sector, culminating in the National Egg Coordination Council, which serves over 200,000 poultry producers.
- Various microfinance interventions by banks and NGOs have influenced the livelihoods of more than twelve million people.

Efforts of agribusiness companies or cooperatives to sell inputs such as the Indian Farmers’ Fertiliser Cooperative (IFFCO) selling through the network of primary agricultural cooperative societies; and Tata Chemicals’ KisanKendras to sell fertilizers and offer extension services have also influenced the livelihoods of large numbers, though they cannot be strictly called a livelihood intervention. Other companies work to strengthen their supply chain such as the ITC Agri Business Division, which runs the eChoupal network for procurement of commodities such as soybean, prawns and coffee; Hindustan Lever’s erstwhile milk procurement and processing business at Etah; and that of Nestle at

Verka in Punjab; and the Rallis India projects for contract farming of wheat and rice, and by Pepsi for tomatoes also have had impact on the livelihoods of the rural people.

### **Evolution of Livelihood Intervention in India**

The livelihood promotion evolved with contributions from people like Rabindranath Tagore, conceiver of the Sriniketan Experiment, Spencer Hatch, of YMCA, Martandam, Fr. Brayane of the Gurgaon Project and Albert Meyer of the Etah project.

Mahatma Gandhi, one of the early livelihood thinkers of 20<sup>th</sup> century, had a holistic vision of livelihoods, with a deep concern for both, the poor and for sustainability. Gandhiji suggested developing local economies by promoting interdependent activities, as a member of a mutually supportive community, eventually leading to “gram swaraj”.

During this period, the emphasis was on building human capital and imparting knowledge. It was believed that people were deprived of good remuneration because they lacked the skills. To address this gap, efforts were made to impart knowledge.

Even in the years after independence, government policies and strategies were based on similar principles. Many educational institutes and research organizations were started during the first five year plan. The Community Development Program of the Government of India was also designed on these lines. The Second Five Year Plan attempted to institutionalize this through the concept of *Panchayat Raj*, to ensure that local decentralized institutions were built for development.

However, the limitation of this approach became evident by late 1940's when they realized that just the skills were not enough, a variety of services to enhance livelihoods were also necessary. Therefore, an alternative strategy was evolved, which tried to integrate various services like building market linkages, technology transfer and building physical and social infrastructure, all in onefold, built around a sector, such as wheat, paddy, milk or soybean.

### **Integrated Sectoral Strategies**

The first two decades after independence rightly focused on development and stabilization of agriculture through irrigation. The large number of irrigation development projects set up by various state governments – such as the Western Yamuna Canal system in western Uttar Pradesh; the Bhakra Nangal dam and canal system in Punjab; the Indira Gandhi Canal and the Chambal dams in Rajasthan; the Nagarjuna Sagar and Sriram Sagar in Andhra Pradesh and the Tungabhadra and Krishna dams in Karnataka, stabilized and enhanced incomes and generated wage employment for the landless farmers.

Some examples of livelihood intervention based on integrated sectoral strategies, covering the entire value chain endeavours like, KVIC, NDDDB and the Green Revolution started emerging during the '50s–60s.

Khadi and Village Industries Commission is the largest livelihood promotion efforts based on Gandhian thinking. Setup in the 1950s, KVIC is an example of integrated sectoral livelihood intervention. It can also be called the first government intervention in the non agriculture sector. The KVIC selected nearly 20 activities, from *gur*(jaggery) making to *khadi* (hand spun, hand woven cloth), and promoted a network of training centres, production Chapters, common processing facilities and marketing outlets.

In order to benefit the rural producers, they need training as well as working capital and access to market.

Similarly, the Green Revolution was another example of integrated sectoral livelihood promotion. Though Green Revolution started with introduction of high yielding variety seeds, infrastructure support was provided in the form of irrigation facilities, roads, warehouses, market yards etc. This was supplemented with development of agricultural credit delivery system, support to fertilizer and other Agri input companies, and investments in agricultural universities for research and training. The Green Revolution was essentially confined to wheat and later paddy, and much later soybean.

National Dairy Development Board (NDDB) set up in 1969 to replicate the Anand model of cooperative milk marketing in the entire country. It created systems of milk procurement, processing and marketing across the country under Operation Flood programs. Further, NDDB made infrastructure investments in chilling centres, feeder balancing dairy plants, cattle feed plants, veterinary medicine and vaccine plants, among others. It also invested in research and development projects related to dairy science and processing of milk products.

### **Strategies for the Vulnerable Segments of the Population**

Though these interventions could influence the livelihoods of millions of people, the poor, the landless, the marginal farmers, women, tribals and people living in remote areas were left out of these interventions because they lack resources for investments. By the 70s, despite the existence of this kind of livelihood development approach, the gap between the rich and the poor was increasing. Deep dissatisfaction with the prevailing inequities resulted in the rise of Leftist, especially the Naxalite Movement in the country.

While the Naxalites chose the path of armed struggle, others who were dissatisfied with the state of affairs joined the voluntary sector. The leading figure in the voluntary development movement in India was JP (Jaya Prakash Narayan). Many voluntary agencies later became larger and professional Nongovernmental Organizations (NGOs) and became an integral part of development scenario.

The efforts of these NGOs were focused on those who were left out of the benefits of mainstream development. Some took this even further to work with the poorest or what was called the 'sarvharavarga'. However, this idea got politicized into the slogan of "garibhatao" and bureaucratized through the launch of the nationwide program for poverty alleviation – the IRDP.

### **Minimalist Credit**

Though various integrated approaches tried to support the livelihood of the poor, it failed to deliver the expected results. The poor required perpetual ongoing subsidies and still did not generate sustainable livelihoods. This led to a new thinking that the poor need access to capital not skills as they know how to manage their livelihoods. In 1974, Ela Bhatt had started the SEWA Bank in India as a cooperative bank of self-employed poor women. Prof. Mohammad Yunus began the experiment of the Grameen Bank in Bangladesh in 1976. In Latin America, large number of NGOs began microcredit programs through solidarity groups.

In contrast to the IRDP type of loans, these efforts quickly multiplied and was highly successful with a high repayment rate of over 95 percent. The 1990s saw millions of households being covered by



microcredit programs, all over the world. In Bangladesh alone, the Grameen bank, BRAC, ASA and Prusik reached out to over 2 to 3 million borrowers each.

The debate between minimalist credit and integrated sectoral promotion approaches began to converge in the 1990s. Several integrated programs dropped many of their offerings and became more focused on credit. On the other hand, many minimalist credit programs, started providing a lot of other inputs. An example of the synthesis is The Self-Employed Women's Association, SEWA, Ahmedabad. While the SEWA Bank was providing only savings and credit, it was embedded in a larger system. SEWA itself was a trade union, which provided the organizational base, the credit reference checks and the extension network of the Bank. The Mahila SEWA Trust provided a range of training and support services to members and staff. Another arm provided healthcare and health insurance services. Over 80 occupational cooperatives provided inputs, production facilities and market linkages.

### **Contingency Approach to Livelihood Promotion**

In 1989, Vijay Mahajan and Thomas Dichter proposed an alternate livelihood promotion strategy through a paper 'A Contingency Approach to Enterprise Promotion'. They argued that promoting enterprises was complex and a better approach was to identify the bottleneck and work on that. In many cases, credit could be the only constraint. In such cases, minimalist credit was right and does work well. In other cases, credit is needed but is not the main constraint, what is needed could be skills, inputs or markets. Their argument was, though a large variety of services are required, all of them are not required at the same time and in every case. Thus, the offering should be contingent upon what is needed in the situation. They also asserted that only a specialised type of organisation could do it. And as it is difficult to build competencies to address all these factors inhouse, collaboration become necessary.

## **5.4 Various Types of Livelihood Interventions**

Livelihood interventions exist in many forms and go far beyond running an income generation program. Some of the approaches of livelihood interventions in India are

**Spatial Approach** Promoting livelihoods in a specified geographical area such as a region, subregion, command area or a watershed.

Supporting locally interdependent economic activities, based on a leading intervention. It was followed by various state governments in the irrigation command areas – the Indira Gandhi Canal in Rajasthan, or the horticulture based DHRUVA project of BAIF in Valsad, South Gujarat.

Supporting livelihoods in a degraded watershed or degraded forest area, such as MYRADA's PIDOW project in Gulbarga, RalegaonSidhi in Maharashtra and the numerous joint forest management projects supported by AKRSP in Gujarat are examples of spatial approach.

Intervention in a cluster of enterprises, such as Ludhiana for hosiery, BadohiMirzapur for carpets, Kancheepuram in Tamilnadu and Sualkuchi in Assam for silk sarees, and so on.

**Segmental Approach** Promoting livelihoods for a vulnerable segment of the population, such as landless households, tribals, women and the disabled.

Supporting livelihoods of the poor through microcredit, for example by SEWA, SHARE, CASHPOR and BASIX

Investing in human development nutrition, health, education, and institutional development (for example CARE's Women's Income and Self Help project, Jharkhand).

Asserting the rights and entitlements approach of the poor – whether to minimum wages, land tenure or access to public services (for example the National Association of Street Vendors of India asserted the rights of livelihood of street vendors).

**Sectoral Approach** Promoting livelihoods along a sector of the economy such as agriculture, or a subsector such as cotton.

Subsector Interventions, such as dairy, fishery, and sericulture, usually covering the value chain from primary production to the ultimate consumer, e.g. NDDDB in dairy.

Intervention along a Vector (something which cuts across all sectors) such as water, power or market linkages. E.g. MART, which has worked on rural haats– local markets.

### **Spatial Interventions**

Many livelihood interventions have a spatial geographical boundary. It may be a single village, a watershed, a river basin, a Chapter, taluka or a district or a region. The main difference between other approaches and a spatial (or area development) approach is that it tries to tackle all the sectors and segments of the population in that area.

### **Area Development with a Leading Intervention (e.g. Irrigation)**

This approach has been followed by governments in various ways – initially to develop the “command area”, that is area irrigated by a canal system of a major dam. Most of these projects began in the 1950s and 60s. The leading intervention here was flow irrigation, and it was supplemented with on farm development such as land levelling and bunding, building drainage channels, training of farmers in irrigated agriculture through extension services, ensuring the availability of tractors, supply of new water responsive varieties of seeds, setting up outlets for fertilizers and pesticides, and finally marketing, in the form of rural roads, warehouses and market yards. This then led to the development of the local economy in an interdependent manner. Over a period, nonfarm activities, based on agro processing improved, and those which supplied goods and services to increasingly prosperous farm households also prospered. While irrigation changed the livelihoods of millions of farmers for the better, it also led to a rise of inequalities, particularly for those who did not have any land.

### **Watershed Development Approach**

A watershed is a catchment area feeding into a single identifiable drainage system, such as a stream or a river. Fostering appropriate local institutions for managing natural resources in the watershed area, to increase the quality and productivity of those resources, constitutes a watershed development program.

Out of a total geographical area of 329 million hectares, approximately 170 million hectares of land in India is classified as degraded. Half of this land falls in undulating semiarid regions, where rainfed farming is practised. Much of this degradation is due to inappropriate use of land and inadequate protection. The introduction of appropriate physical barriers to soil and water flows, together with revegetation and institutional arrangements for their conservation, can improve the productivity of land. Typically, a watershed program includes the following interventions

- Soil and Land Management
- Water Management
- Crop Management
- Afforestation
- Pasture/fodder Development
- Livestock Management
- Rural Energy Management
- Other Farm and Nonfarm Activities
- Community Mobilization

While these components are often understood in general/standardized terms, there is scope for technology development and adaptation.

The Government of India started recognising the value of using a watershed as a Chapter of intervention in the early 1980s. Over the last two decades it has set aside substantial budgetary provisions for micro watershed rehabilitation and development.

Through a range of schemes and programs the government is investing over US\$500 million every year into the rehabilitation of micro watersheds. A set of Guidelines for Watershed Development (GoI 1994) was formulated by the Ministry of Agriculture and Development. They envisage a ‘bottom up planning’ approach, where working with Non-Government Organisations (NGOs) and community participation is the central principle.

### **Holistic Approaches to Livelihood Promotion**

The endeavour called livelihood promotion is very complex. Though many development organizations have attempted to extend a wide variety of services, there are few, which have attempted to address it in its full range. One of the very good examples of providing them could be the Self-Employed Women’s Association (SEWA), which has over 750,000 members. The range and scope of SEWA activities were discussed early in this chapter.

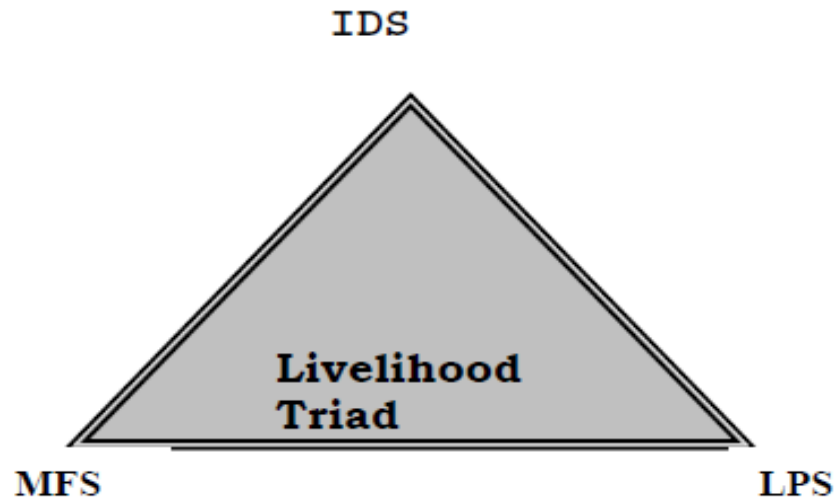
Here is the range that SEWA spans Microfinance services (MFS) Savings and credit through the SEWA Bank, district level self-help group federations linked to the SEWA Bank and insurance services through Vimo SEWA.

Livelihood Promotion Services (LPS) the SEWA staff takes up livelihood identification in the retail outlets and the market facilitation centre, which then informs various occupational cooperatives about market opportunities. The producers are also provided a number of training programs in both technical and commercial aspects of their occupation, linked with input suppliers and equipment makers. SEWA also runs a chain of retail outlets for marketing the products of its members, and a market facilitation centre to link them with overseas customers.

Institutional Development Services (IDS) SEWA itself is a registered trade union and places a lot of emphasis on member organization and member education. It has also adopted the cooperative form for organizing those of its members who need to come together for their work on a day-to-day basis. SEWA also undertakes policy research and advocacy work. It has collaborated for decades with researchers in the field of gender issues, informal sector and microfinance, and through them influenced thinking and policy. Ela Bhatt has been a member of the National Commission on Labour

as well as member of the Planning Commission of India as also a Rajya Sabha MP and had actively tried to draw attention to the cause of self-employed poor women.

There is no better example of holistic livelihood promotion in India than SEWA. There are other examples, such as the NDDDB, CDF, SIFFS, BAIF, MYRADA and PRADAN, all of whom have used different combinations of this strategy. It is possible to conceptualise this work in the form of a “Livelihood Triad”, as shown in the following diagram.



**Figure 5.2 Livelihood Triad**

The rationale behind this is as follows Microcredit in particular, and microfinance (including savings and insurance) in general, is helpful for the more enterprising poor people in economically dynamic areas. However, for poorer people in backward regions, various other livelihood promotion services (input supply, training, technical assistance, market linkages) needs to be provided. Likewise, it is not possible to work with poor households individually as they need to be organized into groups, informal associations and sometimes cooperatives or producer companies, all of which requires institutional development services.

<b>Micro Finance Services (MFS)</b>	<b>Livelihood Promotion Services (LPS)</b>	<b>Institutional Development Services (IDS)</b>
<ul style="list-style-type: none"> <li>• Savings (Only in three districts where we have a banking license)</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of livelihood opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Formations of groups, federations, cooperatives, mutual benefits, etc. of producers</li> </ul>
<ul style="list-style-type: none"> <li>• Credit for consumption as well productive needs</li> </ul>	<ul style="list-style-type: none"> <li>• Productivity enhancement</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity building of the above</li> </ul>
<ul style="list-style-type: none"> <li>• Insurance for lives and livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>• Market linkages – Input supply, output sales</li> </ul>	<ul style="list-style-type: none"> <li>• Accounting and management information systems</li> </ul>
<ul style="list-style-type: none"> <li>• Commodity futures, to reduce price risk</li> </ul>	<ul style="list-style-type: none"> <li>• Local value addition</li> </ul>	<ul style="list-style-type: none"> <li>• Performance management systems</li> </ul>
<ul style="list-style-type: none"> <li>• Financial orchestration (arranging funding from multiple sources for the same sub-sector)</li> </ul>	<ul style="list-style-type: none"> <li>• Risk mitigation (non-insurance)</li> </ul>	<ul style="list-style-type: none"> <li>• Policy analysis and sector work</li> </ul>

**Figure 5.3 Services offered under Livelihood Triad**

### 5.5 Designing a Livelihood Intervention

While making a livelihood intervention, we are continuously engaged in making choices. These choices include decisions on the objectives we wish to achieve, the communities, groups or individuals we seek to help, the sector we work in, the scale of impact we desire, how we organize the livelihood activity, and so on. This module proposes a framework that helps us think analytically and systematically about the choices and help design a livelihood strategy.

The framework is not a planning or evaluation tool its utility lies in the fact that it helps us to be more conscious and thoughtful about the choices we are making. Real learning from the framework will emerge after it is applied to cases or to our own organization’s experience.

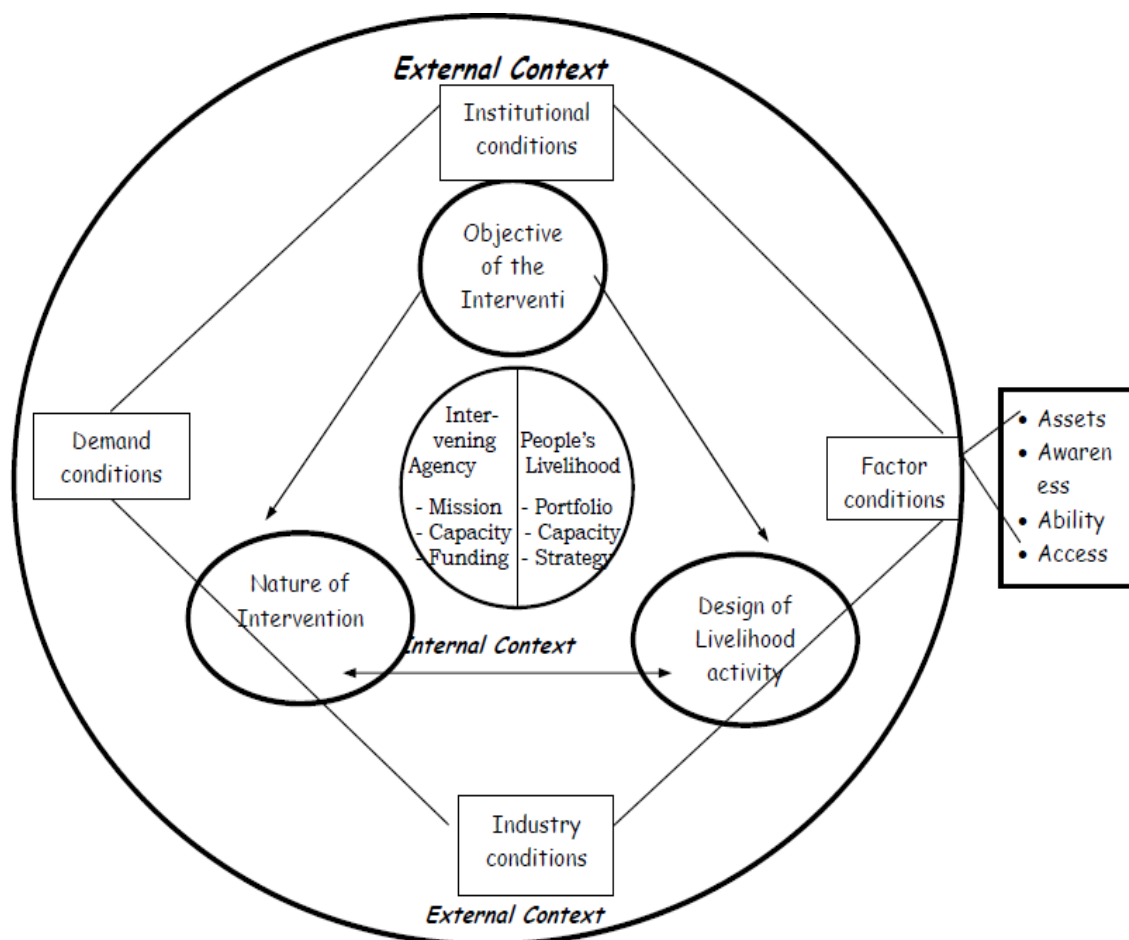
Choices in one element of the design may depend on choices made in another part. This means that when we are designing an intervention we may need to go back and forth to different design elements, as one choice influences another.

#### Elements of Design of Livelihood Intervention

There are three elements in the design of a livelihood intervention. These are (i) the objective of the intervention (ii) the nature of the intervention and the design of the livelihood activity.

Livelihood intervention could be done with an objective to hold migration, as was in the case of PRADAN Lift Irrigation, or for assuring a regular market, as in NDDB, or for ensuring that people got what they were entitled to by law, as in SEWA. In other words, there could be different objectives of a livelihood intervention. As most livelihood interventions evolve around some economic activities, there is also an element of design of the livelihood activity. Interventions of different nature, such as introduction of a technology, or treatment of a watershed, or making credit available could have significant impact of the livelihoods of people.

Further, the Nature of Intervention proposed, and the Design of the Livelihood Activity depends on the chosen objective. However, choices of these elements of design are made within a context the External Context and an Internal Context. This relation can be depicted schematically as follows



**Figure 5.4 A Framework for Analysing Livelihood Intervention Choices**

**a. The Internal Context**

There are two elements of the internal context that we need to keep in mind while designing a livelihood intervention. These are

- People, whose livelihoods are to be promoted
- Organization, which is going to promote/ support livelihoods.

Let us look at these two elements in greater details.

**Internal Context the People**

Livelihood promotion/ support efforts are always around a set of people. Therefore, it is essential to get to know the people and their livelihood patterns before we design any intervention.

Though there may be inadequacies in their livelihood options, they are not bereft of any livelihood activities. Therefore, whatever new activities are proposed will have to be incremental to their present livelihoods. It is, therefore, important to know their livelihood portfolio and their livelihood strategy.

As have been mentioned earlier, poor households are involved in a set of activities to maintain their livelihoods. This constitutes their diversified livelihood portfolio.

Therefore, it is important to understand

- What is the livelihood pattern of the people?
- What is the existing mix of activities in which different members of a household are engaged in?

However, the livelihood portfolio of a household depends on their livelihood capacity. Livelihood capacity of a household is determined not only by the number of people in the family, but also on the skills and knowledge set of the people, their attitudes towards new activities, their asset base, and their opportunities, as well as cultural and social conditions of the area. Therefore, it is important to know

- What are various sets of skills and knowledge that the people have?
- Shortfalls in a household's income and buffers from which these are met.
- Opportunities that are accessible to them as a family in the area, including barriers posed by the social and cultural conditions.
- Finance, including credit available throughout the year, to make investments as well as to even out cashflows at different seasons

But even to use these capacities, different households use different livelihood strategies. Some work in other people's land, while some others chose to migrate. If there is some additional income some chose to expand the existing activity, while some others chose to diversify. (BASIX, 2002) Different people use different strategies for coping with the risks and shocks. Thus, it may also be useful to understand

- The preferences of the families in choice of different livelihood strategies
- The risks and shocks they face
- Their ability and coping mechanism to meet these risks and shocks
- Entrepreneurial ability of the people both in terms of their ability to take risks and their attitudes towards taking new initiatives.

### **Internal Context the Intervening Agency**

The other important element of the internal context is provided by the organization making the intervention. Let us now look at what are the various aspects of our organization we need to pay some attention to.

**Mission** While intending to get involved in livelihood promotion, we need to understand what the mission of our organization is. How does the intervention fit with our mission? How core is livelihood promotion to the mission of our organization? Is it one of the many things our organization does? What competences do we have for such an intervention? Where will the funding come from?

**Competencies** We need to remember that livelihood promotion is a difficult task and it is better to understand what we are getting into, before jumping in. It is important to be aware of our core competency, as it is likely to have serious implications on what intervention we would take up.

For example, AKRSP(I) addressed the problem of migration in parts of Gujarat through a watershed intervention, as the core competency of AKRSP(I) was in making techno managerial interventions,



which is necessary for effective management of watersheds. SEWA chose to organize the beedi rollers of Gujarat to assert their rights as their core strength was in their trade union activities, which is necessary for asserting the rights.

Often livelihood interventions necessitate getting involved in commercial business activities by default. Therefore, it is important to access our strength in that area too.

**Source of Capital** Livelihood interventions need substantial capital investment that may come from different sources. The source could be a donor, or a government programme, or investment made directly in the activity. The more we engage in livelihood promotion, the more funding we need. Grants may be great to get us started, but the total fund available is likely to be limited. A large volume of capital can be mobilized from capital markets if, and only if, adequate returns on investments can be generated.

Different funding sources may also influence the objectives and the implementation strategy. Whether we receive funding from donors or from government, the missions of those agencies are likely to play a major role in design of the intervention.

**Legal Form of Organization** Livelihood activities are commercial in nature. While promoting livelihood activities, we need to remember that all organizational forms are not permitted to undertake all types of commercial activities. Certain part of the intervention may be charitable in nature, like giving training, skill building or building people's organizations; but these often are only a part of the intervention.

Some commercial activities can be taken up in small scale without really violating the law (like any NGO can take up microfinance activities in a small way, many NGOs do marketing of handicrafts and handloom items). But once the activity scales up and volumes are large, legal complications related to taxation, capital mobilization, licenses might arise. Therefore, it is advisable to look at one's own organization form, as this would also help us in taking decisions on our strategy for scaling up.

## **b. The External Context**

There are four elements of the external environment namely, the Factor Conditions, the Demand Conditions, the Industry Conditions and the Institutional Condition, which influence the livelihood choices.

### **Factor Conditions**

Livelihood activities utilize various accessible resources. These resources that go into production of goods and services constitute the Factor Condition. For example, land, water, agroclimatic conditions, availability of skilled people, the prevailing political economy, conditions of roads, availability of electricity. General development indicators of the place define what activities can support large number of livelihoods in that area. These are the Factor Conditions we need to understand.

Presence of different Factor Conditions lead to adoption of different livelihood intervention strategies. For example, the organization PRADAN, made intervention in promoting Lift Irrigation in the Ranchi Lohardaga area, while worked on Leather Subsector in Barabanki Uttar Pradesh, because of different favourable factor conditions (many of the resources) in these two locations.

### **Demand Conditions**

Whatever be the chosen livelihood activity, there is some output of goods / services. These goods / services are bought by some people that constitute the demand for them. Try to find who is demanding them? Is the demand local? Is it increasing, decreasing or stagnant?

Such things determine the Demand Conditions, which in turn determines the number of livelihoods that can be supported, the kind of income that can be generated from the activity.

Demand Conditions play a significant role in determining livelihood intervention strategy. For example, MEADOW could be promoted by MYRADA because there was a scope of promoting ancillary Chapters in that area. Similarly, with the introduction of lift irrigation by PRADAN, people started growing vegetables for which there was a growing demand.

### **Industry Conditions**

The third element of this external context is the nature and status of the industry, of which, the livelihoods activity is a part. Here we use the word 'industry' in a broader sense, to include all economic activities. For example, production of paddy is a part of cereal food industry

Thus, it is important to assess what is the status of the industry, in which we are going to promote livelihoods. Is it growing and vibrant? Is it stagnant and dying? Are there other related and supporting industries that extend services?

These related and support industries often play a critical role in the chosen livelihood activity. Their presence or absence creates conditions for making one livelihood intervention more effective than the other.

### **Institutional Conditions**

All livelihood activities, for that matter, all economic activities are bound by some institutional context. Apart from state policies, tax laws that govern the activity there are local norms, social arrangements that also infringe upon the livelihood choices. Presence of various institutions such as promotional, research and training institutions, producer associations, also has significant influence on the choice of livelihoods.

These together define the Institutional Condition of the livelihood choice. Therefore, Institutional Conditions form the fourth element of the external context, which influence the choices in a livelihood intervention.

Therefore, livelihood interventions are made in a context, which has an internal and external facet.

### **Making Livelihood Intervention Design Choices**

Having taken a close look at the context within which the livelihoods intervention is going to be made, the three elements of the design of intervention are

#### **a. Framing Our Objectives**

Our objectives may be any of the following

- Enhancing income
- Creating assets or wealth
- Increasing food security

- Reducing risk
- Reducing variances in income
- Reducing rural to urban migration
- Organizing producers to have greater control over their livelihoods
- Enhancing the money that circulates within the local economy

The primary objective of most livelihood interventions in India today, is enhancing incomes and food security. Asset creation is usually seen as a means to enhance incomes. While organizing producers, again to achieve better returns, is also common, however, strategies to reduce risk are less common, and very few interventions explicitly focus on enhancing the money that circulates within the local economy. Reducing migration is often an outcome of other livelihood strategies but is very rarely a stated objective. However, in the recent years, with the opening up of the insurance sector, many new initiatives in this direction have been started. ICICI Lombard, ICICI Prudential, AVIVA, among others, has developed different products to reduce the risk of various livelihoods supporting activities.

#### **b. Nature of the Intervention**

The nature of livelihood intervention can vary along three dimensions

- **The Sector in which we Intervene** What livelihood activity we want to intervene in? Do we want to improve on an existing livelihood activity or promote a new one?
- **The Point of Intervention** Which part of the value addition chain will we focus on? Will we provide one missing input, such as technology development or credit, integrate the delivery of inputs, or intervene at multiple points providing several services?
- **The Instrument of Intervention** What is the tool of intervention? Do we want to train the people to make the necessary changes?

#### **Phases in a Livelihood Intervention**

We find that most livelihood interventions go through three distinct phases.

- The pilot phase when we are still testing out a new idea to see if it works on a small scale.
- The development phase the pilot phase has proved successful and we are now developing a model, with the expectation of scaling it up or replicating it.
- The scaling up or replication phase we now have a model which works and we go to scale by expanding or replicating the business.

#### **c. Design of the Livelihood Activity**

Finally, the livelihood activity can be structured on different aspects in different ways. How are we going to organize the producers? Will they be self-employed or wage earners? Who will own the activity or network of activities? Who will manage it? And where will it source its funds? Though these are some of the choices that we have, the type of employment an activity provides, its ownership, management and size are closely interlinked issues. It is important to note that describing the business activity is very different from choosing the subsector or industry in which we intend to work (which we covered above under the type of intervention).

#### **Management of the Livelihood Activity**

Management of the livelihood activity need not always rest with the owners. Even in large corporations, owners engage a group of professionals to manage the enterprise. AMUL, though

owned by farmers of Khaira District, is professionally managed. There are various such choices available.

- Producer managed Livelihood Activities
- Livelihood Activities Managed by Hired Professionals

### **Size of the Livelihood Activity**

The size of a livelihood activity should ideally be determined by viability considerations. Economic viability may suggest the need for a larger activity to achieve economies of scale. But the limited ability of the producers to manage the activity may weigh in favour of a smaller activity. Collective ownership may be an option for managing a larger activity. Example, a farmers' cooperative establishing a paddy processing unit.

PRADAN in its intervention has worked hard to divide the production processes for poultry and mushrooms. Those processes that require more capital investment are to be managed as a large enterprise by a collective group or by a more entrepreneurial member of the community. Other processes those are viable, as microenterprises should be managed by individual households.

### **Funding of the Livelihood Activity**

- Grant based Funding
- Loan based Funding
- Equity

### **Selecting Livelihood Activities Suitable for the Poor in the Area**

Organizations that work directly to promote the livelihoods of the poor have primarily adopted three approaches

- a. Opportunities based approach
- b. Ensuring access to entitlements approach
- c. Approaches for the highly disadvantaged groups

#### **a. Opportunities Based Approach**

The opportunities based approach seeks to primarily improve the economic returns of the target group by helping them leverage existing forms of capital (natural, social, human, etc.) and enhancing them through productivity enhancement and market linkages. This approach therefore necessitates a certain pre-existing degree of awareness within the target group, and availability and access of resources. Natural resource regeneration approach and value chain-based interventions fall under this category.

#### **b. Ensuring Access to Entitlements Approach**

The ensuring access to entitlements approach on the other hand seeks to primarily improve the social and political situation by creating awareness, ownership and access to and control of

- a. Social, economic and political entitlements
- b. Different resources of land, water, forest, human and livestock

This is because net economic gains made by a family pursuing economic activities in a 'low entitlements environment' are insufficient and unsustainable and the livelihood activity itself is highly prone to risk of being lost. These rights and entitlements are experienced at an individual level, and

at household and community levels. For example, within a household, women and men may or may not enjoy the same kind of rights, while within a community different caste groups may have different access rights to the same resource such as a water source or forest resources.

### **c. Approaches for the Highly Disadvantaged Groups**

As the name suggests, the Approaches for the Highly Disadvantaged groups are methodologies specialized and customized to the needs of the target group the disadvantaged, poorest of the poor, women, those affected by natural disasters and people with disabilities.

#### **To Do Activity**

Reflect on the factors that have affected the livelihood choices in your own life.

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Block 3

# Community Resilience and Disaster Risk Management

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# Chapter 1 Introduction

## Introduction

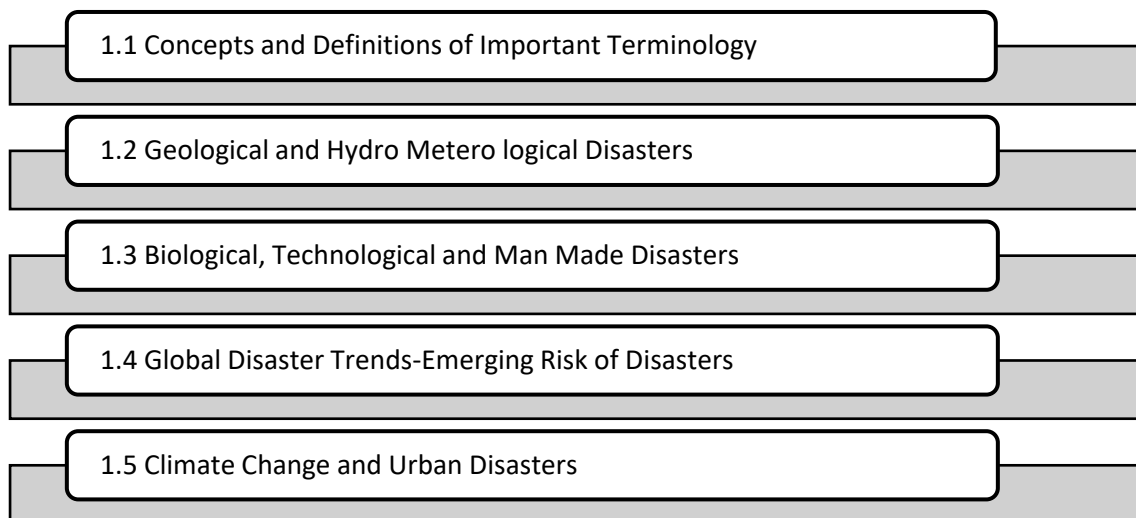
Before discussing the various dimensions of Disaster Risk Management, it is essential to understand some basic concepts and terminology related to Disaster Risk Management. This Chapter introduces the reader to all the key concepts and terminology related to the subject and provides their definitions.

## Objectives

The objectives of this Chapter are

- To introduce the reader to all the key concepts and terminology related to Disaster Risk Management
- To define all the key terms and concepts
- To provide a classification of disasters
- To brief up on global disaster trends and emerging risks
- To brief up on climate change and urban disasters

## Structure



## 1.1 Concepts and definitions of Important Terminology

### Hazard

Hazard can be understood as an unwanted happening or situation, which is capable of causing harm or damage (Toft & Reynolds, 2005). Hazard is anything that can cause disturbance or damage to public, public property, public services and environment in general.

The simplest definition of Hazard is “A hazard is a threat posed to people by the natural environment” (Oliver, 2001). The United Nations defines hazard as “A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation” (UNISDR, 2004).

## Disaster

Disaster can be understood as a severe disruption to the normal functioning of a society caused by the interaction of hazards with exposure, vulnerability and risk thereby causing losses to public, properties, economy and environmental elements.

Disaster is classically considered as an event. According to the International Federation of the Red Cross Societies, “Disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community’s or society’s ability to cope using its own resources.”

However modern researchers consider disaster as the effect or outcome of the hazard rather than an event. According to Dombrowski (1995), “Disasters do not cause effects. The effects are what we call a disaster” (Dombrowski, 1995).

Disasters are often seen as “largescale, stressful and traumatic events” (Dominiciet *al.*, 2005). They result in extensive damage to public, property, network and transport, and also to natural resources. The outcomes are tragic leaving many deaths and injuries and severe disruption to the common lives. These effects disrupt socioeconomical, cultural, and even political settings, of the society thereby obstructing the growth and progress of the society for a considerable period by destroying years of development in minutes. For instance, the Indian Ocean tsunami which occurred in 2004, collapsed 20 years of development of Maldives, a beautiful island which is located southwest to India and Sri Lanka.

According to Quadrantly (2000), disastrous events can be classified by two elements namely capacity and demand. It is represented in table 1.1

**Table 1.1 Classification of Disastrous Events by Means of Capacity and Demand.**

Crisis	Capacity is more than demand – with capacity to spare
Emergency	Capacity reaches or slightly more than demand
Disaster	Demand is more than capacity
Catastrophe	Overwhelming Demand that may wipe out capacity.

### Difference between Hazard and Disaster

Hazards are the starting points for disasters. Hazards may turn into disasters becoming sequential events. A hazard refers to the probability of the happening of a negative event while disaster refers to the negative effects of that event when the effect becomes severe enough to disturb public life.

### Vulnerability

The word Vulnerability comes from the Latin word “vulnerability,” meaning “wounds or harm”. Vulnerability is the scope of being harmed or wounded. In the context of Disaster Management, Vulnerability refers to a set of factors such as economical, societal, physical or geographical factors that decrease the capacity to prepare for and manage the effects of hazards.

Vulnerability is defined as “the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.” According to Blaikie et al., (1994), vulnerability is defined

as “the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard.”

Vulnerability is an important element of Disaster Management in the sense that Vulnerability determines the extent of suffering by the effected society. In other words, Vulnerability is the answer to the question why some societies or economies suffer more than others because of a disaster. Vulnerability is the extent to which a system can face a disaster effectively and the ability of the system to digest and recover from the ill effects of the disaster.

There is a famous quote from a disaster expert from Columbia University which says, “Earthquakes don’t kill people. Bad buildings kill them”. Therefore, it is important to develop measures and infrastructures to reduce vulnerability in order to face disaster effectively. This is where the concept of Resilience comes in to picture, which is being discussed in the next section.

### **Resilience**

Resilience is antonymous to Vulnerability in many ways. While vulnerability increases the exposure to the outcomes of hazard, resilience on the other hand, increases the resistance towards hazard. In other words, increased resilience would lead to reduced vulnerability.

Resilience comes from the Latin word “resilin”, meaning “to jump back”. Resilience is considered as “the capacity of physical and human systems to respond to and recover from extreme events”. It is described as “a buffer, or a shock absorber, promoting sustainable livelihoods by allowing individuals and/or systems an opportunity to cope during an extreme event and not depleting all resources or options for recovery in the following period”.

Resilience is defined as “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.”

C.S. (Buzz) Holing, an ecologist by profession has put forward the concept of resilience in the year 1973. But it gained importance after the Hurricane Katrina in 2005, aiding the concept of disaster resistance. And during the recent past, resilience has turned out to be an essential element of natural hazard management and disaster reduction.

### **Risk**

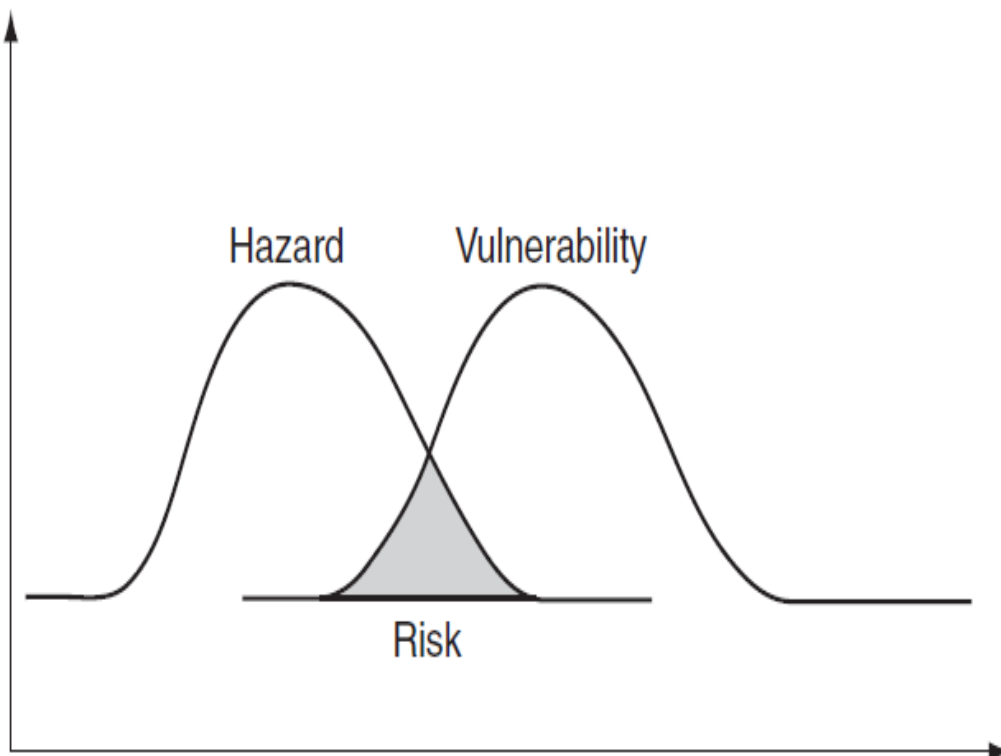
Risk generally refers to the probability of negative consequences which may occur due to particular situations. Disaster Risk refers to the extent of threat presented by a hazard. Disaster Risk is determined by individual, societal and cultural factors (Pidgeon et al., 1992). Disaster Risk refers to the probability of negative consequences which may occur when hazards work together with vulnerable places, public, property, and surroundings.

Disaster risk can be defined as “the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.” The most popular definition of risk is “the likelihood of an event occurring multiplied by the consequences of that event” It is represented as

$$\text{Risk} = \text{Likelihood of Hazard} * \text{Consequences.}$$

Likelihood is expressed in terms of probability (say, 40%) or frequency (say, once in 10 years) while consequences refer to the ill effects or outcomes and it is expressed in terms of three factors estimated loss of lives, estimated number of people injured and estimated damage to properties.

According to the United Nations Disaster Relief Organization (UNDRO) risk is defined as “an overlapping part between hazard and vulnerability” (UNDRO, 1979). This is represented in Figure 1.1.



**Figure 1.1 The United Nations Disaster Relief Organization’s (UNDRO) Definition of Risk (Source UNDRO, 1979).**

## 1.2 Geological and HydroMeteorological Disasters

Disasters can be classified into the below five categories which are explained briefly in the following sections.

1. Geological disasters (earthquakes, landslides, tsunami, mining)
2. Hydrometeorological disasters (floods, cyclones, lightning, thunderstorms, hail storms, avalanches, droughts, cold and heat waves)
3. Biological disasters (epidemics, pest attacks, forest fire)
4. Technological disasters (chemical, industrial, radiological, nuclear)
5. Manmade disasters (building collapse, rural and urban fire, road and rail accidents)

This classification of disasters would help in bringing a usable framework for understanding and identifying the similarities and differences between various disasters and also to make generalizations about disasters. This classification is generally based on the origin of the disaster.

## Geological Disasters

Geological Disasters occur because of disturbances in the natural geological functions mostly due to shifts in tectonic plates and seismic activities. Earthquakes, Landslides, Tsunami, and Mining fall under the category of geological disasters. Each of them is discussed briefly here under.

### Earthquakes

An earthquake is the sudden trembling or shaking of the ground caused by a sudden dislocation of rock in the Earth's crust. The effect of earthquake is most shocking because it affects huge areas, occurs abruptly and is unpredictable. It results in heavy loss of life and property and disrupts public services such as water supply, sewage, network, electricity, transportation etc. They not only destroy villages, towns and cities but the aftermath leads to destabilize the economy and social structure of the nation.



The intensity of earthquakes is measured by using a seismograph. India has witnessed some severe earthquakes. For instance, the Kashmir earthquake occurred in 2005 with a magnitude of 7.6 causing 1, 30,000 deaths in a matter of minutes.

### Landslides

Landslides are defined as down slope movement of rock, debris and/or earth under the influence of gravity. The main factors behind landslides are drainage, bedrock, plant life, climate, earthquakes etc. People should avoid building houses near steep slopes to prevent themselves from falling victims to landslides.





### Tsunami

Tsunamis and earthquakes occur subsequent to centuries of energy build up inside the earth. A tsunami (in Japanese „tsu“ means harbor and „nami“ means wave) is a series of water waves caused by the displacement of a large volume of a body of water, usually an ocean. Earthquakes, landslides, volcanic eruptions, cosmic collisions and meteors that occur under the ocean are the major reasons for the occurrence of tsunami.



Tsunamis can have wave lengths of hundreds of kilometres and can travel at about 800 km per hour, but with less amplitude of about 1 km. But, when it travels towards the coast its wavelength decreases, but amplitude grows rapidly, and it takes very less time to reach its full height. The 2004 Indian Ocean

earthquake followed by tsunami exposed India's vulnerability towards Tsunami. It is one of the deadliest disasters killing more than 2.2 lakhs of people in 13 countries.

### **Mining**

Mining disasters occur during the process of mining minerals. Many people die every year because of these mining disasters especially underground coal mining. In India recently in December 2018, a mining disaster occurred in Meghalaya killing 13 people. Unregulated mining should be strictly controlled and scientifically safe methods of mining should be established.



### **Hydro Meteorological Disasters**

Hydro meteorological disasters refer to natural disasters of atmospheric or oceanographic nature such as floods, cyclones, droughts etc. Floods, cyclones, lightning, thunderstorms, hail storms, avalanches, droughts, cold and heat waves fall under the category of Hydrometeorological disasters. Each of them is discussed briefly here under.

### **Floods**

Floods are the most common and expensive natural disasters. A flood is an excess of water (or mud) on land that's normally dry and is a situation where the inundation is caused by high flow, or overflow of water in an established watercourse, such as a river, stream, or drainage ditch; or ponding of water at or near the point where the rain fell. Floods can occur without warning when a huge amount of rain falls in a short period.

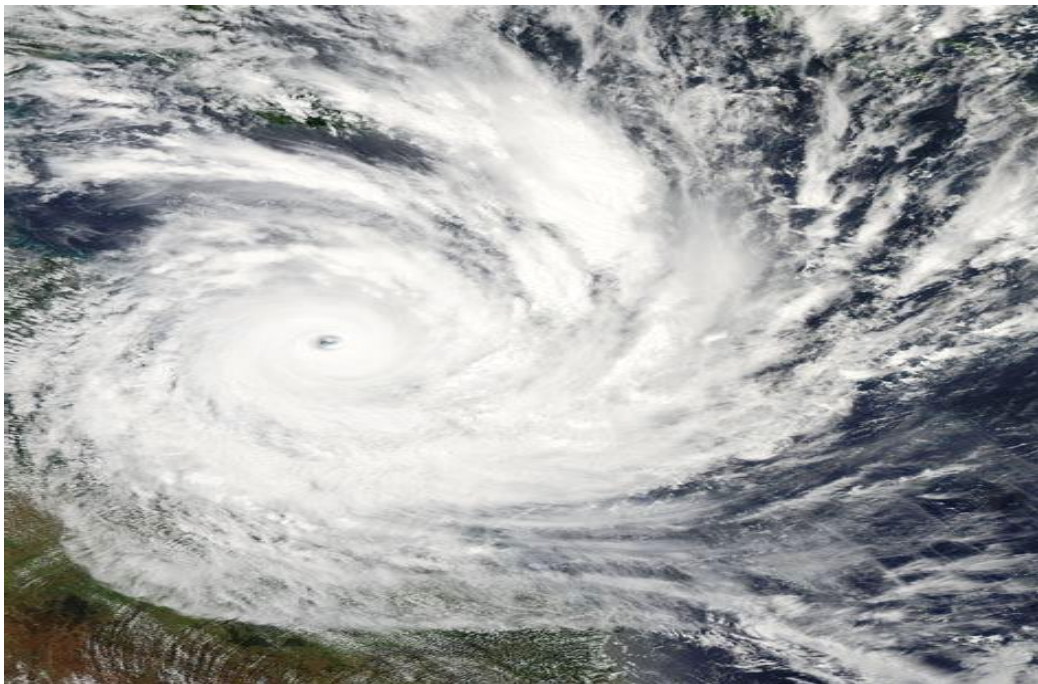




India is one of the most flood prone countries in the world. The principal reasons for flood lie in the very nature of natural ecological systems in this country, namely, the monsoon, the highly silted river systems and the steep and highly erodible mountains, particularly those of the Himalayan ranges.

### **Cyclones**

Cyclone is a tropical weather hazard in which wind force is more than gale force (min 62 kmph). A cyclone is a storm system characterised by a large low pressure centre and numerous thunderstorms that produce strong winds and flooding rain.



## Lightning

Lightning is electrical discharges causing very bright flashes of light in the sky and often when striking the ground, causing severe damage to persons or objects. Lightning is the natural disaster causing the most number of deaths in India every year. Around 1,755 people die annually due to lightning strikes in India. Lightning accounts to 39% of deaths caused by natural disasters in the country.



## Thunderstorms and Hail Storms

A thunder storm produces thunder and lightning while a hailstorm produces chunks of ice that fall from the sky as rain. A thunderstorm, also known as an electrical storm or a lightning storm, is a storm characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere, known as thunder. Thunderstorms are caused by cumulonimbus clouds. They are usually accompanied by strong winds, heavy rain, and sometimes snow, sleet, hail, or, in contrast, no precipitation at all.





Hail is a form of solid precipitation. It is distinct from ice pellets, though the two are often confused. It consists of balls or irregular lumps of ice, each of which is called a hailstone. Ice pellets fall generally in cold weather while hail growth is greatly inhibited during cold surface temperatures.

### **Avalanches**

Avalanches occur when snow cover on a slope tends to slide down the slope because of gravity. Avalanches are seldom observed closely as they usually occur in a short period of one or two minutes. Main causes of avalanches include weather conditions and weight of snow cover.



The Himalayas are well notorious for the incidence of snow avalanches predominantly Western Himalayas i.e. the snowy regions of Jammu and Kashmir, Himachal Pradesh and Western Uttar Pradesh.

### **Droughts**

Droughts occur due to deficiency in rainfall i.e. if the rainfall is less than the annual average rainfall. This can extend to a season or year or even more. Droughts cause reduction in agricultural produce, greater fire hazard, shortage of water levels, increased stock and wildlife death rates, and damage to wildlife and fish habitat.

### **Cold and Heat Waves**

A heat wave is typically defined as a period of extremely hot weather conditions accompanied by high levels of humidity. Heat waves are dangerously hot for the population and may affect human health severely. However, threshold conditions for a heat wave vary across India and around the world. According to the World Meteorological Organization when the daily maximum temperature of more than five consecutive days exceeds the average maximum temperature by 5 °C (9 °F) it results in a heat wave.



Cold waves occur due to a rapid fall in temperature within a day disturbing agricultural, industrial, commercial, and social activity. The northern India, particularly the hilly areas and the neighbouring plains are affected by cold wave conditions and sometimes states like Maharashtra and Karnataka also report cold waves.

### **1.3 Biological, Technological and Man-Made Disasters**

#### **Biological Disasters**

Biological hazards refer to hazards that originate from biological reasons (e.g., epidemics) also called biohazards. Sources of biological hazards include bacteria, viruses, medical wastes, insects, plants, birds, animals, and humans. These sources can cause a variety of health effects ranging from skin irritation, allergies, and infections (e.g., AIDS and tuberculosis) to deaths. Epidemics, pest attacks and forest fire fall under the category of Biological disasters. Each of them is discussed briefly here under.

#### **Epidemics**

Epidemics can be defined as a widespread occurrence of an infectious disease in a community at a particular time. An epidemic is the rapid spread of infectious disease to a large number of people in a given population within a short period of time.

The prominent epidemics in India are Malaria, Cholera and Tuberculosis. They erupt when conditions are favourable for their spread. In 2015 India has witnessed the outbreak of swine flu (H1N1 virus). According to WHO "India has the third largest HIV epidemic in the world. In 2017, HIV prevalence among adults (aged 1549) is estimated as 0.2%"



### Pest Attacks



According to the Indian Council of Agricultural Research, “the pest attacks in India is in a monotonic increasing mode during the recent years, starting from recent Pink bollworm attack in Telangana, Whitefly attack on Punjab, Brown plant hoppers in Orissa to wheat blast diseases in West Bengal and about 3035% of the crop yield in India gets lost because of pests”. Climate Change, unavailability of pesticides a, lack of awareness and support to farmers, overuse and misuse of pesticides are the major reasons for the outburst of pest attacks.



## Forest Fire



Forests fires have existed since olden times. They spoil not only the wildlife and forest wealth but also the surrounding communities. There is a rapid raise in the outburst of forest fires owing to the growth of human and cattle population. According to the State of Forests Report 2015, “the Himalayan regions and the dry deciduous forests of India, particularly in Andhra Pradesh, Assam, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra and Odisha are ecologically sensitive areas” and are the most affected by forest fires.

### **Technological Disasters**

Technological hazards are hazards that originate from the interaction of society, technology and natural systems (e.g., explosions, releases of toxic materials, and oil spills) and they have evolved since the beginning of the industrial revolution. Chemical, industrial and radiological and nuclear disasters fall under the category of Technological disasters. Each of them is discussed briefly here under.

## Chemical Disasters



A chemical disaster is defined as the unintentional release of one or more hazardous substances which could harm human health or the environment. Chemical hazards are systems where chemical accidents could occur under certain circumstances. Such events include fires, explosions, leakages or release of toxic or hazardous materials that can cause people illness, injury, or disability. The major causes for chemical disasters are the unwarranted use and misuse of chemical substances in industries.

### Industrial Disasters

Industrial hazards are hazard agents produced by the extraction, creation, distribution, storage, use, and dispersal of chemicals, such as chlorine, benzene, insecticides, and fuel. The accidental release of toxic gas from a pesticides plant in Bhopal, India in 1984 is often cited as one of the worst industrial disasters in the world. It killed almost 3000 people and about 3 lakhs of people were exposed to the deadly gas and suffered long term permanent disabilities.



## **Nuclear Disasters**

A nuclear disaster is caused by either a meltdown at a nuclear reactor plant or by an accident involving nuclear weapons and nuclear materials, or the explosion of a nuclear bomb. The atomic bombing of Hiroshima and Nagasaki and the Chernobyl nuclear disaster are the biggest nuclear disasters in the world.



### **The Chernobyl Nuclear Disaster**

#### **Radiological Disasters**

According to the National Disaster Management Association (NDMA) “A radiological accident is an event that involves the release of potentially dangerous radioactive materials into the environment. This release is usually in the form of a cloud or ‘plume’ and could affect the health and safety of anybody in its path. Radiological accidents can occur anywhere that radioactive materials are used, stored or transported. Nuclear power plants, transport of radiological materials and disposal of radioactive waste all pose threats.” Certain types of radioactive materials are dangerous and harmful to living beings. Radiation disasters contaminate the environment

#### **Man Made Disasters**

Man made disasters are caused by ignorance or negligence of human beings. Building collapses, rural and urban fires, road and rail accidents fall under the category of Manmade disasters.

## Building Collapses



Building collapses and constructional collapses like flyover collapses, bridge collapses are common in India. Buildings which are under construction and sometimes resident buildings also collapse because of structural failures and unpermitted building of buildings and extra floors with low quality construction materials. In April 2013, a building collapsed on a tribal land in Thane, Maharashtra killing 74 people.

## Rural and Urban Fires



Fire is defined as the rapid burning of combustible material with the evolution of heat and usually accompanied by flame. But uncontrolled fire is one of the major causes of death and property damage. Unpermitted preparation of crackers and usage of house wood for cooking during summers have



caused fires in many rural areas while the lack of minimum fire safety precautions in hotels, hospitals and large buildings can cause fire accidents in urban areas. Burning of dust near katcha houses also causes fire. The incidence of fire accidents is more during summer season.

### Road and Rail Accidents



Road accidents are the most frequent cause of deaths and injuries in India. The major reasons behind road accidents are heavy and unregulated traffic, not following traffic rules and over speeding etc.

Although, travelling on train is highly safe, there is an incidence of rail accidents sometimes. According to the National Crime Records Bureau (NCRB) report, “in the 6year period between 200910 and 201415, there were a total of 803 accidents in Indian Railways killing 620 people and injuring 1855 people, excessive traffic and underinvestment in rail infrastructure being the main underlying factors”.

### 1.4 Global Disaster Trends – Emerging Risks of Disasters

The modern world is experiencing more disasters and newer forms of disasters because of various reasons like urbanisation, industrialisation, climate changes, deforestation, high densities of population, human population displacement etc. Newer forms of disasters are attacking the world in the form of technological disasters and biological disasters. This growth in disasters is an indicator of unsustainable development.

The major global trends and emerging risks of disasters are given below.

1. The number of disasters is raising globally Since the 1970s the number of disasters has almost tripled.

The world today has become vulnerable to newer and more disasters because of biological and industrial threats. New viruses, epidemics and pest attacks are causing more biological disasters. Global warming and rising sea levels have posed newer threats of hydro

metrological disasters. Industrialisation has paved ways for newer forms of nuclear and industrial disasters.

2. More people are being affected by disasters but disaster deaths are decreasing globally. More people are being affected by disasters because of higher densities of populations, growing number of cities and human settlement patterns. However, the death toll has decreased because of improved early warning systems, effective risk reduction, international cooperation and increased preparedness.
3. Disasters are causing more financial losses. Urbanisation has created concentrated wealth, more buildings and infrastructures and more costly technologies. But a single disaster is enough to collapse all this development in a matter of minutes creating huge economic losses. The Great HanshinAwaji earthquake in 1995 at Kobe, Japan is considered as the worst economic loss during the last decade.
4. Poor people and poor countries are affected more. This is because of the economic vulnerability to face the after effects of disasters. Settling in disaster prone areas, unsafe housing, poverty and disease increase the vulnerability of the poor to disasters. The Bangladesh cyclone in 1991 which killed 139,000 is considered one the deadliest disasters in the century. This is an example of how a developing country like Bangladesh suffered heavy loss due to a disaster.

#### **To Do Activity**

Have you ever experienced any hazard in your community such as cyclone, storm, heat wave or any release of hazardous wastes spoiling the environment or any other hazard? Did you help anyone in such situations? What role did you play as a responsible citizen? Elucidate.

### **1.5 Climate Change and Urban Disasters**

Global warming refers to the increase in the average temperature of the Earth's atmosphere and oceans since the mid twentieth century and its projected continuation. Global warming is strongly related to an increase in the concentration of greenhouse gases. This greenhouse effect is causing global warming which in turn is driving climate change. Rapid industrialisation, burning of fossil fuels, traffic pollution and increased usage of Air conditioners and refrigerators are all reasons behind greenhouse effect and climate change. The following are the results of global warming and subsequent climate change.

#### **1. Changes in Rainfall**

Global warming would bring changes in rainfall leading to more extreme wet and dry seasons and more severe storms.

#### **2. Melting of Glacial and Ice Cap**

Increased temperatures are melting Arctic ice and glaciers more rapidly than before. This can cause floods downstream of the glacier and would displace people and animals living in the surroundings.

#### **3. Raising Ocean Temperatures**

Increased temperatures are also raising ocean temperatures. The average change in ocean temperature over the past 40 years was 0.3°C in the top 300m and 0.06°C in the top 3.5 km (Hyndman and Hyndman, 2011). This can cause intense storms, hurricanes and cyclones.

#### 4. Effects on Ecosystems and Human Race

Global warming would change ecosystems all over the world. Certain plants and organisms cannot survive in their current locations creating new species. It also can make some species extinct from the planet. For instance, polar bear and arctic fox have already turned out to be endangered species caused by melting of polar icecaps. Agricultural activities would be severely affected by global warming.

#### To Do Activity

What kind of a community do you live in (urban or rural)? What kind of hazards is your community vulnerable to? Explain the social, geographical, climatic and technological vulnerabilities of your community. Also illustrate the kind of measures and support activities undertaken by the government and public to prevent the community from hazards.

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# Chapter 2 Disaster Management Cycle, Risk Reduction and Managing Risks

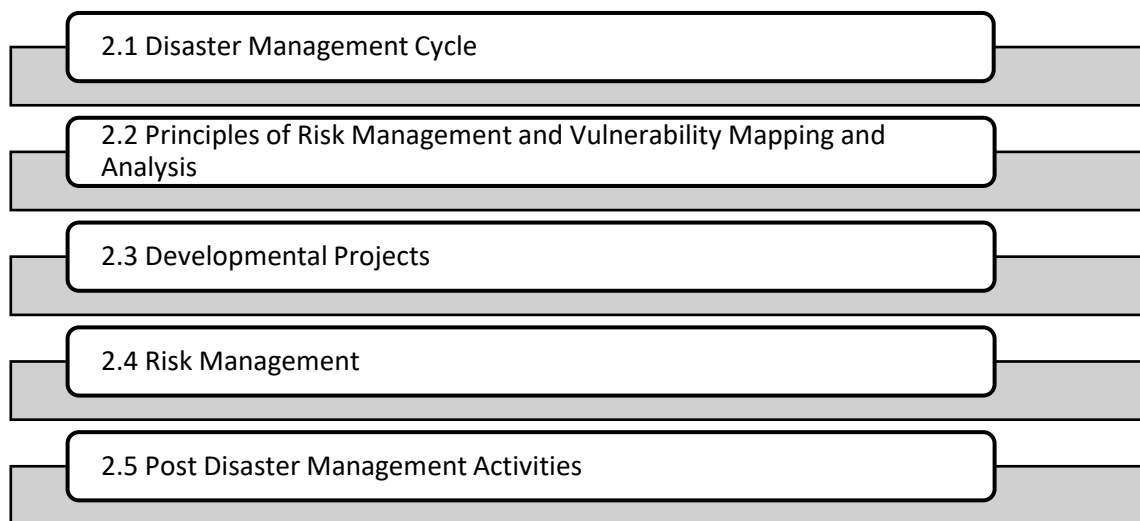
## Introduction

This chapter is devoted to the various phases of disaster management cycle. This chapter will provide an overview of risk reduction and Risk management. It is to be noted that the four disaster management phases may or may not, occur in isolation or in the precise order. In many instances' phases overlap, and the severity and the type of disaster greatly influences the length of each phase. The resources that can be brought to bear to cope with impacts of the disaster also effect the length of the phase. This chapter deals the topic from this perspective.

## Objectives

- To discuss the phases of disaster management cycle
- To explain the measures for/ risk reduction
- To understand the components of risk management

## Structure



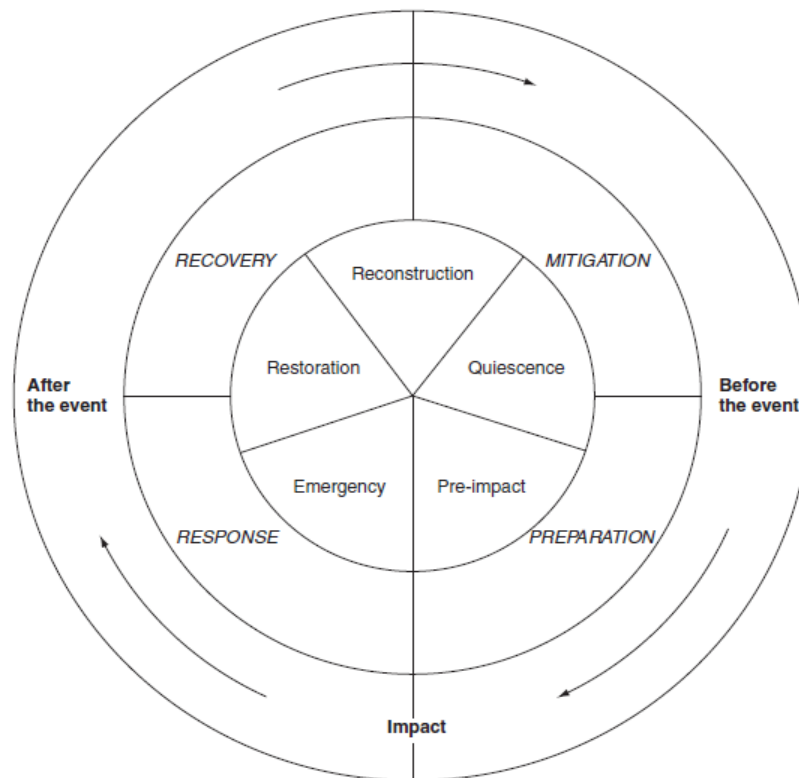
## 2.1 Disaster Management Cycle

According to Mileti et al. (1999), “the contemporary hazards adjustment prototype and accompanying model of human choice group hazard adjustments into four temporal phases or stages of emergency management mitigation, preparedness, response, and recovery. Collectively these four stages are known as the disaster cycle or disaster management cycle. The cycle illustrates the continuous process through which disaster management agencies – with help from governments, businesses, and other entities –strategizes to minimize losses from hazards, assure speedy assistance to disaster victims, and adopt measures to recover from the impacts of disasters swiftly. For greater preparedness, better warnings, as well as reduction in individual and community vulnerability to hazards and disasters it is essential to adopt appropriate actions and measures at all stages in the cycle. The four stages of the disaster management cycle are not exclusively marked from each other, but these are useful



categories to strategies activities, research, and policy for comprehensive hazard/disaster management” (Mileti, 1999; Prater and Lindell, 2000; Tierney *et al.*, 2001).

Figure 2.1 shows the four phases of disaster management cycle. “The phases of mitigation and preparedness takes place before an extreme natural event occurs, whereas response and recovery take place after the event occurs. There are multiple adaptations of the diagram illustrating the ongoing nature of activities undertaken in each phase, every activity seeks to lessen probable fatalities and injuries, property losses, give prompt assistance to the victims and achieve rapid and effective disaster management.



**Figure 2.1The Disaster Management Cycle (Source Alexander (2000), p. 3.).**

### Phase 1 Mitigation

Mitigation refers to the policies and actions that aim to reduce and/or eliminate individual and/or community vulnerability to injury and/or harm from future disasters. Mitigation agencies strive to tackle the hazard such that it reduces its impact on individuals and communities. Thus, natural hazards have the potential to turn into disasters in the lack of mitigation measures. For this reason, the Federal Emergency Management Authority (FEMA) in the United States considers mitigation as the “cornerstone of disaster management” and it has defined mitigation as “any cost effective action taken to eliminate or reduce the long term risk of life and property from natural and technological hazards”. The phrase ‘cost effective’ essentially means that a mitigation measure should be productive to its cost over the long term. There is a spike in disaster mitigation programs from both public and private agencies since the 1970s. Literature also highlights the importance of allocation of budgets for mitigation more than for relief by the government.

As noted, “Mitigation measures and actions generally are in place before a disaster occurs and they include a range of options and/or adjustments an individual or community may take to reduce long term risk to life and property from a disaster event” (Maskrey 1989; NCDDEM, 1998). Nevertheless, the measures of mitigation are flexible enough to be implemented at any time – before a disaster, during a disaster, or after a disaster, as well as during recovery or reconstruction phase. The destruction induced by future disasters depends upon the type and magnitude of an extreme event and the types of mitigation measures introduced. These measures tend to be expensive, time consuming, largescale, high technology solutions, and managed and financed by large centralized agencies.”

### **Mitigation Goals**

The goals of mitigation are

- Risk likelihood reduction
- Risk consequences reduction
- Risk avoidance
- Risk transfer, sharing, or spreading

### **Mitigation Measures**

The following are the essential measures towards mitigation

- Land use planning and regulation
- Building codes and standards
- Insurance
- Engineering
- Warning

### **Phase 2 Preparation**

Preparedness or Preparation is the level of alertness and readiness of an individual, a household, or a community against a looming disaster. Amongst various activities, preparedness includes formulating, testing and exercising disaster plans, providing hazard warnings, communicating with the public and others regarding disaster vulnerability and what to do to reduce it, evacuating people from harm’s way, conducting emergency response drills, and providing disaster training for emergency responders and the general public.

According to Tierney *et al.*, (2001), an important measure of hazard preparedness is the acquisition of equipment to support emergency action. Such a measures ensure that the resources required for carrying out an effective response in shortest possible time are already in place prior to the onset of a disaster. Hence, they can be obtained promptly when needed. Preparedness reduces the adverse consequences of such extreme events. It facilitates an effective response and also heightens the ability of social units to effectively counter a disaster. Hazard preparedness is divided into two categories physical preparedness and social preparedness. The former centres on adopting steps to ensure that facilities and infrastructures can withstand disaster impacts so that the buildings and their contents do not become a serious threat to life and cause any injuries. Social preparedness includes actions (e.g., understanding what state and federal programs are available at the time of disaster, planning for situations involving hazard warning and evacuation, establishing emergency recordkeeping systems, and developing disaster plans) to ensure that community organizations are able to adequately respond to the needs of victims in the event of a disaster”(Tierney *et al.*, 2001).

They also point out that “both physical and social preparedness are seen as part of a fivephase preparedness cycle that consists of (i) raising awareness, (ii) conducting hazards and vulnerability assessments, (iii) improving knowledge about hazard and how to cope with them, (iv) planning, and (v) practice” (Tierney *et al.*, 2001).

### **Measures of Preparedness**

As indicated above, preparedness means a range of activities and/or actions that are undertaken and carried out (at different levels) immediately and/or any time before a disaster. Preparedness aims to save lives and minimize property damage. A number of preparedness activities are discussed below. This discussion is followed by an analysis of preparedness activities at four distinct levels households, organizations, communities, and state and national preparedness consecutively.

#### **1. Warnings**

Hazard warnings include a range of activities such as effective monitoring and accurate forecasting of a forthcoming event, developing warning messages, and disseminating the messages to those at risk.

#### **2. Evacuation**

Evacuation is “the primary protective action utilized in disasters such as floods, tsunamis, large wildfires, hurricanes/cyclones, and volcanic eruptions. It refers to the movement of people away from a potential or actual hazard impact area for the primary purpose of ensuring safety. Evacuation can take place before, during, or after a disaster occurs.”

#### **3. Exercises**

“The most effective way to prepare for a disaster is to conduct practice exercises on a regular basis. The primary goal of such exercises is to improve operational readiness for people who participate in disaster response and recovery efforts. Exercises enhance a community’s overall emergency management capabilities and provide useful tools for local programs to train emergency personnel and evaluate their operational readiness.”

### **Phase 3 Response**

Response refers to all types measures and steps adopted immediately before, during, and after the occurrence of a disastrous event to prevent the loss of lives, minimize any damage to property, and improve the effectiveness of recovery at shortest possible time. It is commonly more narrowly defined to mean only the instantaneous actions (e.g., search and rescue operations for survivors, emergency medical care for the injured including mental health counselling, the proper identification and disposition of dead bodies, provision of temporary shelter, water, sanitation and food, repair utilities and key infrastructure, security for victims, protection of property, closure of roads and bridges, and attending to secondary hazards such as fire (in the case of earthquake) taken immediately after a disaster at various levels, such as individual, household, community, national, and international (Mitchell and Cutter, 1997).

According to Mileti, (1999), removal of debris from disaster affected areas and the restoration of roads and infrastructure destroyed by disaster are also part of the emergency response. Disaster response represents the early part of the relief phase of the disaster recovery cycle.

According to Fothergill and Peek, (2004), the emergency response may continue for hours or days, perhaps up to one week depending on the magnitude and type of the event. Scare or poor response creates a human induced tragedy that aggravates the plight of the victims of a natural disaster. Such

response also mirrors the failure of government agencies and public administrators to provide adequate emergency support to disaster victims of a major event (Fothergill and Peek, 2004).

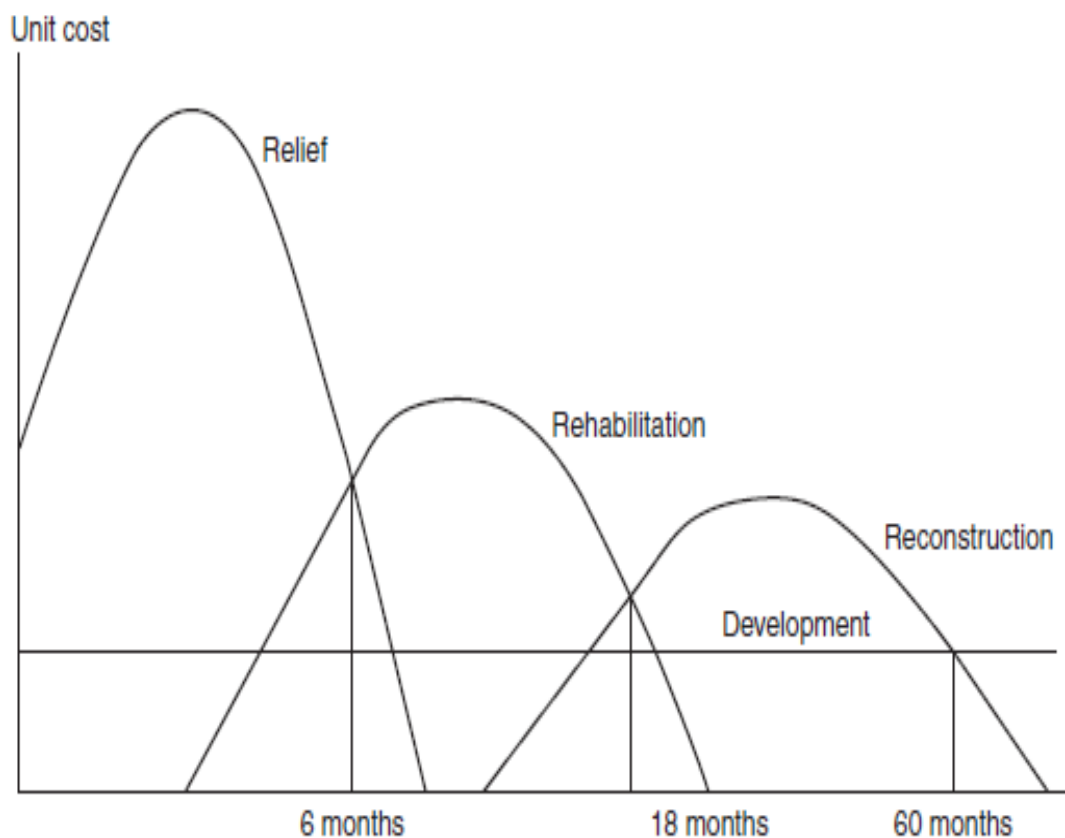


Figure 2.2 The Disaster Recovery Cycle (Source Fiercest al. (1995), p. 363.)

### Response Measures and Activities

#### i. Search and Rescue Operations

Search and rescue (SAR) operations contains multiple activities to be undertaken immediately post a disaster to identify and rescue victims who are injured and/or caught under collapsed buildings, debris, or by moving water and rescue them from danger or confinement. There are three distinct but interrelated procedures under SAR procedures that consist of locating victims; rescuing them from whatever condition has trapped them; and providing basic first aid. The last action is essential to stabilize victims so that they may be transported to regular emergency medical facilities for further treatment. Providing food and water to trapped victims is also the responsibility of SAR personnel.

#### ii. Emergency Medical Care

Natural disasters are at the helm for the deaths and injuries of thousands every year throughout the world. Generally, the causality is relatively greater in terms of injuries than the loss of life from direct impacts associated with an extreme event. For example, Hurricane Katrina killed some 2000 people, but injured 5698 – almost three times the number of fatalities.

#### iii. Identification and Disposal of Dead Bodies

After the occurrence of a major natural disasters, emergency managers, public health personnel, and members of the general populace fear that corpses may cause epidemics.

**iv. Debris Removal**

Most natural disasters produce large amounts of debris and its disposal poses as a challenge for public officials. The removal of debris is the clearance, removal, and/or disposal of items damaged or destroyed by extreme events. It is necessary to (i) allow the safe passage of emergency response vehicles in the aftermath of a disaster, (ii) eliminate public health and safety hazards, and (iii) ensure the economic recovery of the affected community to benefit the community at large. Delay in the removal of debris removal adversely impacts response and recovery operations. Thus, crew must be deployed immediately for debris removal.

**v. Repairing Utilities and Key Infrastructure**

Power, water, sewer, communication networks, and other infrastructure, such as transportation arteries, ports, airports, and rail lines, are often damaged or destroyed by major disasters.

**Post Disaster Sheltering and Housing**

Most families are forced seek alternative temporary housing, post a disaster event until a permanent housing solution can be found (Johnson, 2007). Unlike survivors of hurricanes/cyclones or earthquakes, flood survivors may need alternative housing if their homes are submerged under flood water. The magnitude and type of disaster generally results into number of people requiring post disaster shelter depends on. In general, earthquakes, hurricanes/cyclones, and floods render more people homeless than do tornadoes or droughts.

**Phase 4 Recovery**

According to Quadrantally, (1998), the primary objective of the recovery phase is the reversal of the damaging effects of the disaster. The recovery phase of the disaster management cycle begins during or after the response phase. In disaster literature, the term recovery' has been used interchangeably with rebuilding, reconstruction, restoration, rehabilitation, and post disaster redevelopment. Historically, the term recovery broadly implies putting a disaster-stricken community back together to its predisaster state. Hence, recovery meant to bring a disaster stricken community back to the state of 'normalcy' that is the pre disaster stage. (Quarantelli, 1998).

According to Phillips, (2009),the recovery process consists of a range of stages, steps, and sequences that disaster survivors, organizations, and communities undergo at varying rates. The postdisaster phase is also often used to measure the current safety standards and propose future disaster preparedness techniques. Disaster recovery is a process of interaction and decisionmaking among a variety of groups and institutions, including households, businesses, and the community at large. (Phillips, 2009).

**The Disaster Recovery Cycle**

The disaster recovery cycle consists off our overlapping phases or cycles development, relief, rehabilitation, and reconstruction (Figure 2.2). The first and second cycles (i.e., development and relief) activate instantaneously following a disaster, however differ in the length of their duration. While development encompasses the entire recovery period, relief largely lasts up to six months or a year, with a peak in the middle. In addition to providing disaster relief, this phase also imparts

information about entitlements and other opportunities associated with their assets and livelihoods to disaster victims. The third cycle (i.e., rehabilitation) may last anywhere between 12 and about 20 months, and the last cycle from one to four years. (Middleton and O’Keefe, 1998).

### **Recovery Resources**

According to Coppola (2007), to recover from the impact of disasters an adequate funding is required at all levels. The onus or the cost of reconstruction is divided between various sectors of the community. The local government is responsible for rebuilding public facilities and infrastructure, whereas the private sector, including industries, individuals, and households, will be responsible for rebuilding houses and businesses. The private sector along with help from governments at various levels, helps to restore overall economic vitality. The success in recovering from impact of a disaster however depends on how quickly and successfully the affected community and disaster survivors are able to secure assistance from external resources (Coppola, 2007).

#### **To Do Activity**

Choose one of the world’s deadliest disasters and identify the various stages of disaster management cycle that were implemented to face the outcomes of the disaster.

## **2.2 Principles of Risk Management and Vulnerability Mapping and Analysis**

### **Principles of Risk Management**

The International Organization for Standardization (ISO) identifies the following principles of risk management

#### **Risk management should**

- Create value – resources expended to mitigate risk should be less than the consequence of inaction
- Be an integral part of organizational processes
- Be part of decision-making process
- Explicitly address uncertainty and assumptions
- Be a systematic and structured process
- Be based on the best available information
- Be tailorable
- Take human factors into account
- Be transparent and inclusive
- Be dynamic, iterative and responsive to change
- Be capable of continual improvement and enhancement
- Be continually or periodically reassessed

### **Principles of Disaster Response**

According to Erik Auf Der Heide

- “Because of the limited resources available, disaster preparedness proposals need to take cost effectiveness into consideration.

- Planning should be for disasters of moderate size (about 120 casualties); disasters of this size will present the typical inter-organizational coordination problems also applicable to larger events.
- Interest in disaster preparedness is proportional to the recency and magnitude of the last disaster.
- The best time to submit disaster preparedness programs for funding is, right after a disaster (even if it has occurred elsewhere).
- Disaster planning is an illusion unless it is based on valid assumptions about human behavior, incorporates an interorganizational perspective, is tied to
- Because of the limited resources available, disaster preparedness proposals need to take cost effectiveness into consideration.
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- Interest in disaster preparedness is proportional to the recency and magnitude of the last disaster.
- The best time to submit disaster preparedness programs for funding is, right after a disaster (even if it has occurred elsewhere).
- Disaster planning is an illusion unless it is based on valid assumptions about human behavior, incorporates an interorganizational perspective, is tied to resources, and is known and accepted by the participants.
- Base disaster plans on what people are "likely" to do, rather than what they "should" do
- For disaster planning to be effective, it must be inter-organizational.
- The process of planning is more important than the written document that results.
- Good disaster management is not merely an extension of good everyday emergency procedures. It is more than just the mobilization of additional personnel, facilities, and supplies. Disasters often pose unique problems rarely faced in daily emergencies.
- In contrast to most routine emergencies, disasters introduce the need for multi-organizational and multidisciplinary coordination.
- In disasters, what are thought to be "communications problems" are often coordination problems in disguise.
- Those who work together well on a daily basis tend to work together well in disasters.
- Disasters create the need for coordination among fire departments, law enforcement agencies, hospitals, ambulances, military units, utility crews, and other organizations. This requires interagency communication networks utilizing compatible radio frequencies.
- Procedures for ongoing needs assessment are a prerequisite to efficient resource management in disasters.
- A basic concept of triage is to do the greatest good for the greatest number of casualties.
- Triage implies making the most efficient use of available resources.
- Good casualty distribution is particularly difficult to achieve in "diffuse" disasters, such as earthquakes and tornadoes that cover large geographic areas.
- Effective triage requires coordination among medical and nonmedical organizations at the disaster site and between the site and local hospitals
- Panic is not a common problem in disasters; getting people to evacuate is



- Inquires about loved ones thought to be in the impact zone are not likely to be discouraged, but can be reduced or channeled in less disruptive ways, if the needed information is provided at a location away from the disaster area.
- Many of the questions that will be asked by reporters are predictable, and procedures can be established in advance for collecting the desired information.
- Newsworthy information will rapidly spread among news organizations and from one type of media to another.
- The media will often withhold newsworthy disaster stories it feels would be detrimental to the public.
- Local officials will have to deal with different news media in times of disaster than those with which they interface on a routine basis.
- Adequate disaster preparedness requires planning with the rather than for the media.
- The propensity for the media to share information and to assume 'command post' perspective facilitates the establishment of a central source of disaster information."

### **Hazard and Vulnerability Mapping and Analysis**

The purpose of a hazard map is to analyse the underlying phenomenon of a hazard and to make it known to residents. A disastrous phenomenon cannot be stopped by a hazard map. But the effective use of hazard maps can minimize the magnitude of disasters. The objective of a hazard maps is to create awareness and provide residents with the information on the range of possible damages and disaster prevention activities. Hazard maps delineate zones that are identified in terms of the probability of occurrence of potentially damaging phenomena within a certain span of time within a specified location or an area (Varnes,1984).

### **Types of Hazard Maps**

There are two types of hazard maps

#### **1. Resident Educating Maps**

Resident educating maps are meant to educate the residents within an area about the forecast of danger. The information on areas of potential danger or places of safety and the basic knowledge on disaster prevention are given to residents. Therefore, it is important to note that such must be imparted in an understandable form.

#### **2. Administrative Information Maps**

Administrative information maps are the elementary materials that administrative agencies utilise to provide disaster prevention services. These hazard maps can be used to set up a warning system and the evacuation system, as well as evidence for land use regulations. They may also be used in preventive works.

### **Steps in Creating Hazard Maps**

1. Forecasting a range of disaster to define the subject phenomenon and its scale and forecast the range of disaster using the digital simulation technology
2. Collecting the disaster related information to be inserted in the hazard map and representing the information in the hazard map.
3. Publishing the maps by distributing directly to people or through Internet or by any other means. Then, the disaster prevention activity will start using the hazard map.

### **Guiding Principles for Creating Hazard Maps**

While creating a hazard map, the topographic map of the subject area is necessary. The topographic models and photographic maps may be acquired from a satellite. It is necessary that the data for which any potential phenomenon can be forecast is made based on sound scientific methods. The objective of a hazard map is to inform residents of a potential disaster and therefore the map should be designed with the representations and contents that are comprehensible to nonprofessional people. The digital analysis introduced before should be supported by complete data so there is a considerable cost in carrying out the calculations. Irrespective of how high the data accuracy is, the digital computation is a forecast. This is something that cannot be represented by computations. It is crucial to recognize the limitation of these hazard maps. When the phenomenon and its scale are different from the forecast ones, the range of disaster will also be different. Such cases will occur as there is no case in which a disaster occurs as shown in a hazard map.

Digital analysis, disaster history and disaster geomorphological land classification map provide the necessary information for disaster prevention. Therefore, it is essential to use them in forecasting a disaster pattern.

### **Contents of a Hazard Map**

- A base map is required. A topographic map or a photographic map (orthophotos) can be used as a base map. The topographic map is supplementary to understand the information for a hazard map than orthophotos. A photographic map contains information in large amounts to interpret it.
- The most essential information that should be provided to residents must be disaster prevention information. Mainly, the forecast area of disaster should be included and the past disaster records may be included as needed. Or, the map can be divided into both types the second information to be disseminated to residents is evacuation related information. The location of refuges and evacuation routes to be used in case of a disaster are shown in the map. Residents can see their evacuation route and places of refuge from the hazard map. In addition, the system and instructions to accurately warn of an impending disaster and appropriate evacuation procedures to residents are also described in the map, such as for example, a forecasting siren or a warning siren.
- The behaviour of disaster phenomena and the basic knowledge on natural phenomena are also described.

### **Hazard Maps and GIS**

"Hazard maps are truly good with Global Information System or GIS. To begin with, GIS is exceptionally valuable in orchestrating high volumes of information important to create a hazard map. At that point, it tends to be utilized for examination of spots of refuge. Three dimensional portrayals and Digital cartography is additionally accessible with GIS."

### **Utility of Hazard Maps**

"A hazard map is noteworthy just when it is openly discharged to occupants. They can be utilized by inhabitants in evacuation and when their lives are in peril. Organizations should attempt endeavours to disseminate disaster prevention information to occupants by methods of hazard maps. It is important to outfit inhabitants with school instruction and disaster prevention training once every

year or more and repeatedly disperse the calamity prevention data through different techniques. It is smarter to plan events which will build the inhabitant's interest and participation

"Hazard maps are not straightforwardly identified with preventive works, however utilizing hazard maps, it is conceivable to appraise the expense of harms because of a disaster. Further, hazard maps can be utilized for the financial assessment of a preventive work and for Benefit Cost (B/C) examination. Accordingly, the priority order of preventive works can be resolved."

### Vulnerability Analysis

As indicated by Blaikie et al. (1994), "Vulnerability examination is created from a scope of financial ways to deal with dangers and what we could call 'the calamity of daily existence'. Vulnerability examination attests that for there to be a disaster there must be a characteristic danger, yet in addition a vulnerable populace. Vulnerability examination is perplexing and reliant on enormous informational collections, and on subjective examination that requires contribution of the general population concerned in the evaluation of their vulnerability" (Blaikie et al, 1994; Cannon 1994).



Figure 2.3 Disaster Map of India

A vulnerability assessment "the way toward distinguishing, evaluating, and organizing (or positioning) the vulnerabilities in a framework. Instances of frameworks for which vulnerability evaluations are performed incorporate, however are not restricted to, data innovation frameworks, vitality supply frameworks, water supply frameworks, transportation frameworks, and correspondence frameworks. Such assessments might be led in the interest of a scope of various associations, from independent

companies up to huge territorial foundations. Vulnerability from the point of view of calamity the executives means evaluating the dangers from the perspective of disaster management means assessing the threats from potential hazards to the population and to infrastructure. It might be led in the political, social, financial or ecological fields".

"Vulnerability assessment has many things in common with risk assessment. Assessments are typically performed according to the following steps

1. Cataloguing assets and capabilities (resources) in a system.
2. Assigning quantifiable value (or at least rank order) and importance to those resources
3. Identifying the vulnerabilities or potential threats to each resource
4. Mitigating or eliminating the most serious vulnerabilities for the most valuable resources".

### **Procedure for Conducting Vulnerability Analysis**

The purpose of Vulnerability analysis is "to evaluate hazards, their risk of actual occurrence, and the impact on life, property and business if the hazard occurred". Following are the steps involved in Vulnerability analysis

1. Determining the probability and impact of hazard

Probability and impact are ranked as follows

Low – If the occurrence is rare

Moderate – If the occurrence is unusual

High – If the potential for occurrence is high or already experienced.

Then risk is calculated as follows

Risk = Probability X Severity of impact on life, property and business

2. Address mitigation, preparedness, response, and recovery for these hazards.
3. For high risk/high impact hazards, develop individual incident action plans.

### **Vulnerability Factors**

Both natural and manmade factors are responsible for vulnerability. Some of the factors are discussed below

#### **Population Displacement**

Populace displacements both a reason and a result of catastrophe. There is proof of positive connection between poverty and economic inequality and rural to urban migrations, in that more the degree of poverty and income inequality, more is the degree of rural to urban migration. The phenomenon is most seen in poor underdeveloped nations where the poor relocate from rural to urban territories in look of livelihoods."

As per Dhar (2002), "In the most recent decade, issues identified with disaster and development led population removal and resettlement and rehabilitation have created extensive discourse Population displacement, immediate and backhanded, results from natural and human procedures for example natural disasters, urbanization and industrialisation, natural resource development, agricultural change and infrastructure extension. There is additionally a worry that particularly vulnerable social gatherings, including women, ethnic minorities, and landless individuals have for the most part suffered more, than others from displacements" (Dhar, 2002).

### **Urbanisation**

As indicated by Jain and Ghosh (2005), "Rural to urban migration has prompted unmanageable urbanization and urban blockage that has constrained human and physical capital extension in high-risk zones. Therefore, the damage inflicting capability of disasters has gone up. Urbanisation has gotten its wake, development of informal settlements, dangerous living conditions, disease, class strife and social capital exhaustion as certain sections have been socially and financially marginalised. Globalization has likewise contributed from numerous points of view to expanding the vulnerability of the urban poor by making 'uncertain' employment however, the conspicuous effect is by all accounts the improvement of life and better opportunities for all." (Jain, Ghosh, 2005).

They additionally discover that "Around 25 percent of the total population lives in zones of high risk from natural disasters. Also, regulatory and political issues are caused because of the influx of exiles, which disturbs the political and social grid of the district, similar to the influx of Bangladeshi refugees in India, following the 1971 war. Epidemics and congestion are other managerial issues caused because of mass flood of displaced people."

### **Gender**

"Vulnerability because of Gender is a consequence of gradual addition of unfair social practices after some time, which has caused debilitation of ladies in social economic and political arenas. Gender inequality in social, economic and political circles has brought about tremendous contrasts among men and women in crisis circumstances, concerning matters, for example, household decisions about utilization of relief resources, voluntary relief and recovery work, access to evacuation sanctuary and relief goods, and employment in disaster planning, relief and recovery programs among other areas of concern in disaster relief. Disaster mitigation as additionally response strategy, especially concerning control over relief assets need to consider this part in decision making it progressively fair and in general, more effective."

### **Economic Factors**

It is demonstrated that "there is a Positive correlation between poverty, disasters and environmental degradation. Relative vulnerability of individuals is similarly a lot higher in underdeveloped nations than in the developed world. According to United Nations gauges, albeit least developed nations show less physical presentation to dangers (11%) they represent far more prominent number of losses, (53%). On the opposite side, the most developed nations represent more (15%) physical exposure to risks and record for altogether less (1.8%) victims. The derivation drawn is that the extent of calamity endured is straightforwardly connected to the degree of development, which clarifies generally the reality of the Third World representing altogether a greater number of misfortunes than the developed nations.

"While all countries might be up against with common risks, natural hazard, the poorer developing countries, specifically, are lopsidedly vulnerable against dangers. Disasters can carry poor communities to much more poverty, as family units might be constrained into increased debt to remake homes and address essential issues. Impacts of disasters on poorer developing nations are long lasting and cause extreme interruption in the GDP. The impacts are more serious than in developed nations, regularly draining rare budgetary assets and redirecting significant assets towards post fiasco relief" (United Nations, 2004).

### **Geographical Factors**

As effectively noted in the prior chapters, "global warming threatens to disturb agribusiness in developing nations. But most greenhouse gas emissions have occurred in the developed world. Global warming has especially expanded the vulnerability of coastal areas, particularly small island development states (SIDS) in that sea level rise will compromise the delicate ecosystem of these districts, raising the frequency and degree of natural dangers like tsunamis, cyclones, floods and storm surges. Coastal zones, wetlands and coral reefs are probably going to be hurt which go about as natural buffers against risks like violent winds and cyclones. The greatness of disasters is additionally prone to be more prominent as a result of the expanded pace of infrastructure development that has occurred in these regions over the last few years, attributable to population pressure and growing attractiveness of these regions from the point of view of tourism" (UNDP, 2002).

### **Livestock Vulnerability**

As indicated by Herrmann, et al., "Livestock on occasion is the poor man's only resource. In contrast to different types of property, livestock loss misfortune is fundamental and irreplaceable. The unexpected issue here is quick arrangement of alternate occupation, which is the most troublesome piece of rehabilitation. Deficiency of food affects livestock before it begins to influence individuals. Malnutrition and infection decrease their productive capacity, which results in diminished pay for the farmer. Diseases among livestock likewise spread during disasters. These still remain the less thought about parts of disaster management. Insurance protection is the best choice however needs to be duly considered in India. Vulnerability factors would be examined in detail in resulting units" (Herrmann et al, 2010)

#### **To Do Activity**

1. On the basis of a general assessment of the vulnerability of area in which you reside, list the essentials needed for its management.
2. Approach any one government departmental agency, a private organisation, a person residing in your area, talk to them and observe their reactions and elicit their views towards disaster management. Write a brief report on it.

### **2.3 Developmental Projects (Dams, Power Plants etc.)**

Developmental planning infers planned budget allocations for economic and social uplift by professing welfare state ideology. In spite of the fact that the term 'welfare state' has not been decisively characterized and is buried in political controversy especially in the context of liberalisation and globalisation following accession of the free market economy principle, and the public choice theory that advocates the free market system, mixed economy countries like India persist with developmental planning for the uplift of the marginalised sections of society through state sponsored welfare programmes. This has created a dilemma of sorts, which needs to be resolved in the interest of sustained momentum of development. The chief agency for development planning in India is the Planning Commission.

Every developmental planning needs some basic infrastructure. The infrastructure may be physical, social or environmental. These infrastructures are used in some way for the developmental process.

### **To Do Activity**

Identify the developmental projects taken up by the government in your area and list out the points highlighting the importance of these projects to your community. Also try to analyse how they help or hinder disaster management in your area.

In many cases, ordinarily, faulty management or unorganised implementation mechanism, the developmental processes, rather than being good for the general population, makes vulnerable conditions. For instance, dam construction for mitigating floods, may turn into the reason for extreme flooding in the dam area. Uncontrolled utilization of synthetic manures for expanding production may destroy the yields. Similarly, the construction of roads, railroads, and so forth for the comfort of individuals, may prompt avalanches or different risky conditions for the general population. Along these lines, planning for development itself creates unfavourable and vulnerable conditions. At miniaturized scale and large scale levels, numerous such models can be found in developing as well as developed nations. In addition, the variables causing natural hazards, some human exercises additionally cause annihilation of the slope and ground surface, starting a chain of uncontrolled erosion in the mountain landscape. Unearthing's for mining, streets, channels and structures have added extraordinarily to the mass developments, and strengthening of erosion in hilly territory

## **2.4 Risk Management**

Disaster Risk Management is the utilization of disaster risk reduction policies and strategies, to prevent new disaster risks, reduce existing disaster risks, and manage residual risks, contributing to the strengthening of resilience and reduction of losses. Disaster risk management actions can be sorted into; prospective disaster risk management, corrective disaster risk management and compensatory disaster risk management (also referred to as residual risk management).

### **Emergencies and Post Disaster Assistance**

The overall aims of emergency and post disaster assistance are

- “To ensure the survival of the maximum possible number of victims, keeping them in the best possible health in the circumstances;
- To re-establish self sufficiency and essential services, as quickly as possible for all population groups, with special attention to those whose needs are maximum, the most vulnerable and underprivileged;
- To repair or replace damaged infrastructure and regenerate viable economic activities. To do this, in a manner, that contributes to long term development goals and reduces vulnerability to any future recurrence of potentially damaging hazards.
- In situations of civil or international conflicts, the aim is to protect and assist the civilian population, in close collaboration with the International Committee of Red Cross (ICRC) and in compliance with International Conventions. In case involving population displacements (due to any type of disasters), the aim is to find durable solutions as quickly as possible, while



ensuring protection and assistance as necessary in the mean time. There are important differences, however, between sudden and slow onset disasters. Differences also emerge when comparing the specific geographical situation and the disaster's socio/political context.

### **The Following are Typical Activities for Survival**

**Warning** refers to arrangements to rapidly disseminate information concerning imminent disaster threat to government officials, institutions and the population at large in the areas at immediate risks.

**Evacuation/ Migration** Evacuation involves the relocation of a population from zones at risk of an imminent disaster to a safer location. For evacuation to work there must be a timely and accurate warning system, clear identification of escape routes, an established policy that requires everyone to evacuate when an order is given, and a public education programme to make the community aware of the plan. The movement of people from the zone where they are at risk to a safer site is not in fact, evacuation but crisis induced migration.

**Search and Rescue** Search and rescue, often known by the acronym SAR, is the process of identifying the location of disaster victims that may be trapped or isolated and bringing them to safety and medical attention.

**Post Disaster Assessment** The primary objective of assessment is to provide a clear, concise picture of the post disaster situation, identify relief needs and develop strategies for recovery. The post disaster assessment must distinguish between predicate chronic conditions, which are worsened in critical times, and post disaster trauma among victims. Ready resources are the key factor in post disaster assistance. As a long term measure, Primary Health Care centres should be reformed and readied for emergency situations.”

### **Emergency Operation Centre**

“An emergency operations centre (EOC) is a central command and control facility (EOC) is a headquarters and control office in charge of doing the standards of carrying out the principles of emergency preparedness and emergency management, or disaster management functions at a strategic level during an emergency, and ensuring the continuity of operation of a company, political subdivision or other organization. An EOC is responsible for strategic direction and operational decisions and does not normally directly control field assets, instead leaving tactical decisions to lower commands. The common functions of EOCs are to collect, gather and analyze data; make decisions that protect life and property, maintain continuity of the organization, within the scope of applicable laws; and disseminate those decisions to all concerned agencies and individuals.

EOC may be permanent or temporary facilities provided to support the government during disaster events. The functions carried out in the EOC include the

- Collection, collation and dissemination of information to the government and the public
- Provision of advice to the Disaster Chairs of Local Committee, and
- Coordination of Government resources in support of disaster affected communities

The EOC in its extended form will continue to function as long as the requirement for emergency relief tasks proceeds till the long term plans for rehabilitation are finalised. For overseeing long haul restoration programs, the responsibilities will be that of the respective line departments. This will empower the EOC to take care of other disaster circumstances, if need be.

The principle branches in the EOC during a disaster situation will be operations, services, resources, infrastructure, health, logistics, communications and information management. Each branch will have distinct tasks to perform with a branch official of the position of Deputy Secretary or Additional Secretary. The limit of the different branches to organize among themselves and with the field units will ultimately decide the quality of response.

The facilities and amenities to be given in the EOC incorporate well structured control room and workstations for the branch and nodal officials furnished with VSAT, wireless communication, hotlines, and intercoms. The EOC as an information bank will keep all area and state level activity plans and maps. Arrangement of a vehicle with wireless communication will be made for the EOC during typical occasions."

### **Incident Command System**

"The Incident Command System (ICS) is an institutionalized way to deal with the command, control, and coordination of emergency response giving a typical progression inside which responders from various organizations can be effective. ICS was at first created to address issues of between interagency response wildfires in California and Arizona however is currently a segment of the National Incident Management System (NIMS) in the US, where it has advanced into All Hazards situations. Likewise, ICS has acted as a pattern for similar approaches internationally. ICS is interdisciplinary and authoritatively adaptable to meet the following disaster management challenges

- Meets the needs of a jurisdiction to cope with disasters of any kind or complexity (i.e. it expands or contracts as needed).
- Allows personnel from a wide variety of agencies to meld rapidly into a common management structure with common terminology.
- Provide logistical and administrative support to operational staff.
- Be cost effective by avoiding duplication of efforts, and continuing overhead.
- Provide a unified, centrally authorized emergency organization."

**Emergency Relief** "Emergency relief is the provision on a humanitarian basis of material aid and emergency medical care necessary to save and preserve human lives. It also enables families to meet their basic needs for medical and health care, shelter, clothing, water, and food. Government has to tackle the problem of too much relief too soon, from indigenous and international donors, probability of theft and other forms of criminality, black market in relief items etc. Inventory management should be a crucial component of disaster preparedness. The delivery of emergency relief will require logistical facilities and capacity of well organised supply service is crucial for handling the procurement or receipt, storage, and dispatch of relief supplies for distribution to disaster victims.

**Communication and Information Management** All the above activities are dependent on communication. There are two aspects to communications in disasters. One is the technical aspect, or the equipment that is essential for information flow, such as radios, telephones and their supporting systems of repeaters, satellites and transmission lines. The other is information management, content and protocol of knowledge communication, which communicates what information to whom, what priority is to be given to it, and how it is to be disseminated and interpreted. Coordination of effort is dependent on communication.

**Survivor Response and Coping** In the rush to plan and execute a relief operation it is easy to overlook the real needs and resources of the survivors. The assessment must take into account existing social coping mechanisms that might even obviate the need to bring in outside assistance. On the other hand, the ambit of social service may be widened as special needs of the vulnerable sections; the sick and the homeless etc. would have to be handled.

### **Security**

Security is always a priority issue after a sudden onset of natural disaster(s). There are incidents of looting which have to be immediately controlled. Communal feelings are also incited during periods of such stress, which turn to serious law and order problems if not controlled immediately.

**Emergency Operations Management** None of the above activities can be implemented without some degree of emergency operations management. Policies and procedures for management requirements need to be established well in advance of the disaster. The chief actor in emergency operation and management are the army and the police and paramilitary organisations. The concept of incident command is pertinent here. It was started in America after a series of wild fires in California in 1970s. Incident command is based on integration of efforts in the field between all organisations, a ‘modular organisation’, which expands, and contracts as newer agencies join it; agency autonomy, modern operations as per modern management principles like management by objectives (MBO), end orientation; discovering new sources of resource, joint planning, resource management, timely intelligence and thoroughly planned operations (Irwin, 2002).”

## **2.5 Post Disaster Management Activities**

### **Rehabilitation and Reconstruction**

“Rehabilitation and reconstruction complete the disaster response activities. The disaster occurred because the society was vulnerable against the effect of the hazard concerned. Rehabilitation and reconstruction must therefore not be seen as a process of simply restoring what existed previously. Assistance to rehabilitation and reconstruction must therefore be planned on the basis of a thorough assessment and appraisal of the technical and social issues involved. While arranging of such assistance cannot be unduly rushed, it must be accomplished as expeditiously as possible. There are two reasons for this

- a. Certain rehabilitation and reconstruction measures if organised rapidly enough, can shorten the period for which emergency relief assistance is needed and eliminate the need to invest resources in temporary measures.
- b. The window of opportunity may be short for the risk reduction measures in reconstruction (of housing for instance) or new development initiatives (especially social aspects). The majority of people affected are the poor. For the poor, disasters represent lost of property, jobs, and economic opportunity. In real terms, that can mean enormous total economic setback. Therefore, reconstruction assistance should be designed to
  - Relieve economic constraints and reduce the cost of reconstruction
  - Inject capital into the community
  - Create employment opportunities
  - Support and strengthen existing economic enterprises

Timely and imaginative planning is therefore required to dovetail rehabilitation and reconstruction with short term relief measures, and to make the most effective use of external financial resources,

materials, and technical assistance in achieving development gains while satisfying humanitarian needs.”

### **Post disaster Damage and Needs Assessment**

“Assessments in terms of the extent and monetary value of damages can be carried out with the help of local government offices (e.g., municipal engineering office, municipal agricultural office, etc.), field surveys and interviews.

- a. Effects on Basic Services electricity, water supply (potable water and irrigation water), sanitation
- b. Infrastructure buildings, hospital/clinics, homes, road systems
- c. Livelihood crops, sources of food/products
- d. Landscape soil stability, extent of coastline and land erosion
- e. Ecological Communities vegetation, terrestrial and aquatic life, forest cover

In order to come up with a proper and acceptable program for recovery and rehabilitation, it is also important to understand the felt needs of affected communities. Consulting affected populations through interviews prior to any recovery program ensures public acceptance and support of any planned endeavour. A need assessment helps prioritize particular areas that need the most immediate action for rehabilitation.”

- a. Infrastructure and Services
- b. Community Livelihood
- c. Priorities for Habitat Restoration

### **Early Recovery – Reconstruction and Redevelopment**

“The measures adopted in post disaster situations are critical to support human lives and sustain the delivery of ecosystem goods and services such as food, fuel and protection from natural events. These measures help to rehabilitate human communities and natural ecosystems. A key concept here is climate resilient recovery (CRR) where communities are not only provided with assistance to recover from climatic change events but are also equipped to deal with future disasters better. Reconstruction is a much longer term activity that will involve permanent rebuilding, improved infrastructure, and recovery with enhanced preparation for the next climate change related event. It should aim to build a better standard than what existed before (‘build back better’ principle) and be guided by the ecosystem approach to recovery and rehabilitation

1. Climate Resilient Livelihood
2. Climate Resilient Infrastructure
3. Ecological Restoration

Ecological restoration encompasses intentional human interventions that are aimed to assist the recovery of ecosystems and habitats after disturbance or damage. Recovery is reckoned to have been achieved when the system contains sufficient living (e.g., microbial, animal and plant life) and nonliving (e.g., soil, water, air) components that will allow development without further intervention or subsidy (SER 2004). Restoration can promote the preservation of the biodiversity of the ecosystem, conservation of endemic and indigenous species, and the sustainable management of the ecosystem.”

#### **To Do Activity**

1. In your local area, attempt to find out who is the government official responsible for disaster preparedness, and about the key functionaries in different departments entrusted with the task of disaster management in your area and about their roles.
2. Enquire whether there is an Emergency Operations Centre (Control Room) in the vicinity of your area? If yes, what are its contact telephone numbers? Who is the officer responsible of EOC? Has any disaster preparedness plan been prepared for your area? If yes, make efforts to study it. In your opinion what improvements could be made in the disaster preparedness plan?

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# Chapter 3 Disaster Risk Reduction Tools and Capacity Building

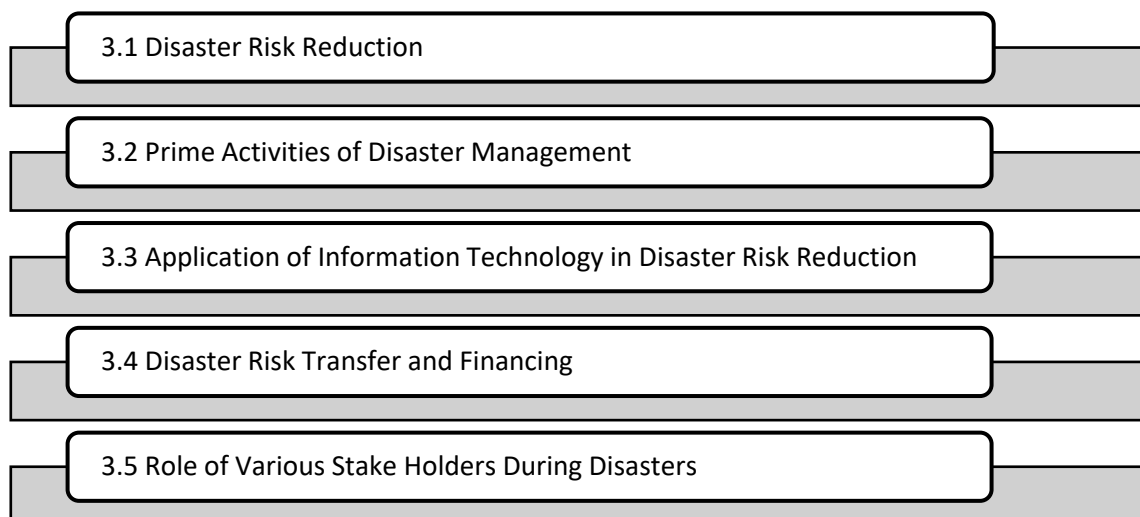
## Introduction

This chapter is devoted to understanding the process of Disaster risk reduction and its various tools. More specifically, this chapter will provide a framework for risk reduction and capacity building. It focuses on prevention and mitigation of disasters. It also deals with risk financing and risk transfer tools. This chapter also discusses how ecosystems and systems approaches are used to manage disaster reduction.

## Objectives

- To discuss the process of disaster risk reduction
- To explain the tools for risk financing and risk transfer
- To understand eco systems management for risk reduction

## Structure



## 3.1 Disaster Risk Reduction

Burton, Kates and White (1978) suggest that “Man can purposely adjust to the risk of environmental extremes by changing habitation or resource use, community action, restorative activity or redistribution of loss. Other adjustments are incidental but contribute to reducing loss. Disaster reduction strategies include the assessment of the vulnerability of facilities crucial to the social and economic infrastructure, the use of effective early warning systems, and the application of many different types of scientific, technical, educational and other skilled abilities.”

### Risk Reduction Framework

Many researchers opine that disasters disrupt development altogether and increase poverty and vulnerability of people, particularly in low income countries. Therefore, there is a need for protective strategies on a sustained basis to preserve the civilisation, which has been built assiduously over ages.

The risk of disasters is fundamentally linked to environmental problems and unresolved issues essential for sustainable development. Accordingly, there are two major objectives of disaster reduction policies (1) to enable societies to be resilient to natural hazards and (2) to ensure that development efforts do not increase vulnerability to those hazards.

ISDR's publication, 'Living with Risk A Global Review of Disaster Reduction Initiatives' published in 2002 unfolds the disaster risk reduction framework as composed of the following fields of action.

- Risk awareness and assessment including hazard analysis and vulnerability and capacity analysis.
- Knowledge development including education, training, research and information.
- Public commitment and institutional frameworks, including organisational, policy, legislation and community action.
- Application of measures including environmental management, land use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and, financial instruments.
- Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.

## Framework for Disaster Risk Reduction

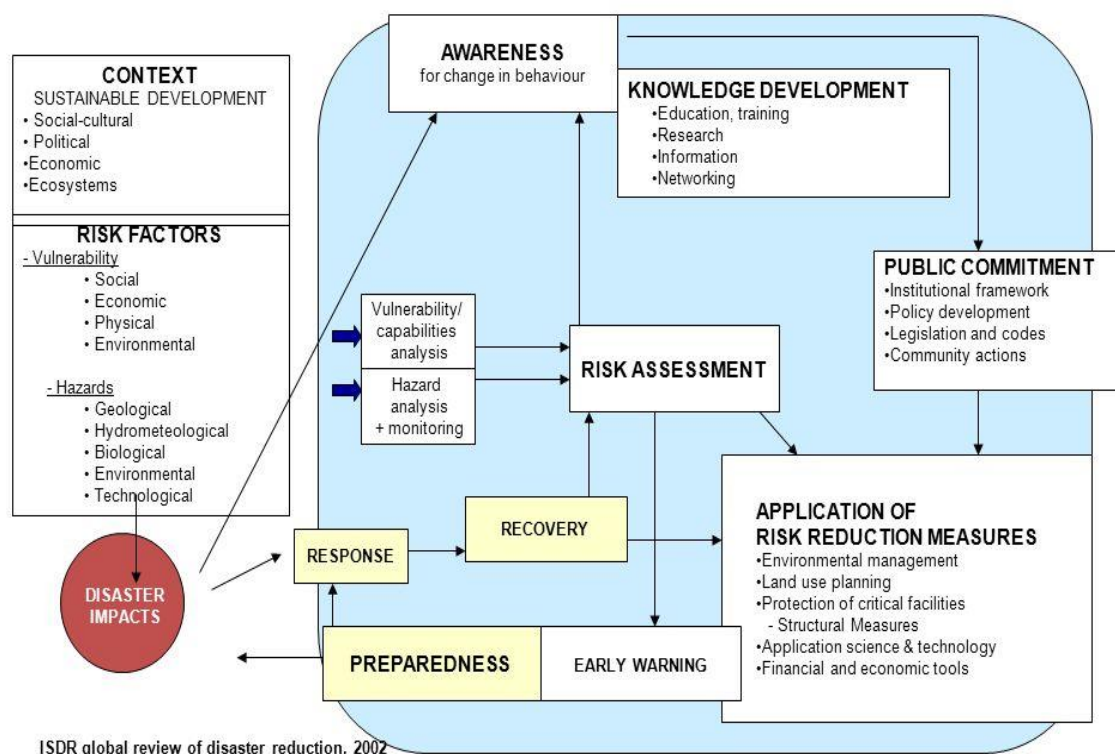


Figure 3.1 Framework for Disaster Risk Reduction



(Source [https://www.google.co.in/search?biw=1366&bih=651&tbm=isch&sa=1&ei=laMlXYLjL\\_LYz7sPlulyAw&q=framework+for+disaster+reduction+reduction+&oq=framework+for+disaster+reduc](https://www.google.co.in/search?biw=1366&bih=651&tbm=isch&sa=1&ei=laMlXYLjL_LYz7sPlulyAw&q=framework+for+disaster+reduction+reduction+&oq=framework+for+disaster+reduc))

### **Disaster Planning for Risk Reduction**

Disaster planning implies securing administrative arrangements, involving unity of command, span of control, line and staff coordination, delegation, etc. Precisely, it involves principles of organisation theory to provide the administrative arrangements to prevent small scale, frequently occurring disasters, which keep disrupting growth and set back development by several years. Planning is followed by risk identification in order to secure a facility/area from likely risks. A disaster plan is the result of a wide range of preliminary activities (Lindblom, 1999). Disaster planning is implemented both at the micro (at an institutional level, involving instituting fire protection systems, electrical systems, plumbing, and protection against environmental hazards etc.) and the macro levels. The objectives of disaster planning as given by Anil Sinha (2002) are given below.

- Forecasting and forewarning of disaster threat and providing the institutional and organisational setup and logistics, personnel, inventory, finances, etc., to achieve desired level of preparedness.
- Mobilisation of resources from internal and external sources.
- Taking organisational and administrative steps, including disaster action plans, regular and periodic updating of plans and projects securing institutional wherewithal to implement it, providing for a horizontal and vertical coordination through a network of official and nonofficial agencies involved viz. government departments, civil defence military and paramilitary organisations running through the central, state and field levels.
- Placing on ground, well equipped modern forecasting and warning system and reliable and fast communication system.
- Generating capabilities for prompt and rapid rescue, relief and rehabilitation work.
- Proper planning for medical assistance and health cover.
- Providing for other miscellaneous needs like stocking and distribution of food, medicines, shelter, clothing, evacuation, transportation and longterm resettlement and rehabilitation of affected communities.
- Securing water management practices and provision of clean water is often problem and a necessity post disaster.
- Government initiatives implying long term measures identified by the central government, instituting intensive training programmes, building data based on documentation of disasters and lessons to be learnt there from, and, dissemination of information.
- Integration of disaster management with overall development planning.
- Improving public awareness.
- Investment in R&D, use of modern technology, particularly information and remote sensing technologies.

### **Interventions Needed**

- Develop district wise and institution wise integrated disaster action plans for all types of disasters both natural and manmade. It involves preparedness, mitigation, risk mapping, relief and rehabilitation for disasters like landslides, accidents, earthquakes etc.

- Evolve a model state plan to ensure uniformity of approaches, actions and systems throughout and their periodic updating.
- Provide training for local industries and businesses to ensure better implementation of plans and procure cooperation of the private corporate sector and the voluntary sector.

#### **To Do Activity**

Elicit various elements of disaster risk reduction framework. Explain the role of each element in the whole process.

### **3.2 Prime Activities of Disaster Management**

#### **Prevention of Disasters**

Globally, studies involving handling of disasters show that the aftereffects of a disaster are more harmful than the disaster itself. Hence the awareness towards taking preventive measures to minimise the impact of disasters have increased.

Following are the various measures taken for disaster prevention which may be adopted by any country/state.

- Integrating disaster prevention with national development plans. Disaster prevention must be a part of development plans and projects of any state. Multiple methods followed in this regard include construction of embankments for reducing the occurrence of floods, promoting earthquake resistant structures, watershed management, rainwater harvesting, alternative cropping patterns etc., to manage drought and the like.
- Formulating a disaster management policy for the country, providing for a legal framework for the management of all types of disasters in a comprehensive manner. This facilitates proper implementation of preventive measures at all levels by the concerned organisations.
- Making the community aware and educated on various types and levels of disasters. Develop their capacities to manage disasters and build community leadership to make them self reliant and resilient to cope with disasters.
- Involving educational and training institutions, corporate sectors, NGOs and the public to generate awareness among all concerned stakeholders.
- Strengthening of existing infrastructure such as buildings, communication system, water supply, sanitation facilities etc. for better prevention of disasters.

The High-Powered Committee (2001) has put forward the following proactive measures to bring in the culture of prevention of disasters

- Proactive measures for disaster preparedness and mitigation should be administrative, financial, legislative and techno legal.
- Capacity building in disaster management must be at policy, institutional and individual levels.
- Raising and recruitment of professionals to build up expertise for mitigation and management of disasters.
- Enforcement of protection and prevention measures.

- Generating a proper understanding of risk among different stakeholders, training and confidence building among professionals and masons with appropriate development planning strategies.
- Rehabilitation is to be viewed as a long term phased activity. Midterm rehabilitation vision is focused on reconstruction of infrastructure and livelihoods, while long term programmes are geared towards addressing the issues of prevention, mitigation and preparedness.

### **Mitigation of Disasters**

Mitigation refers to actions taken in advance to minimise or eliminate the risks arising out of disasters. Mitigation involves taking short term as well as long term measures to reduce the extent of damage to the community, location and property. It is concerned with prevention of occurrence of disasters, reduction of risks, consequences associated with them, and dispersal of risks. The preparedness, response and recovery phases of disaster management are concerned with occurrence of specific events, while mitigation activities relate to events that may occur in the future.

#### **Mitigation aims at**

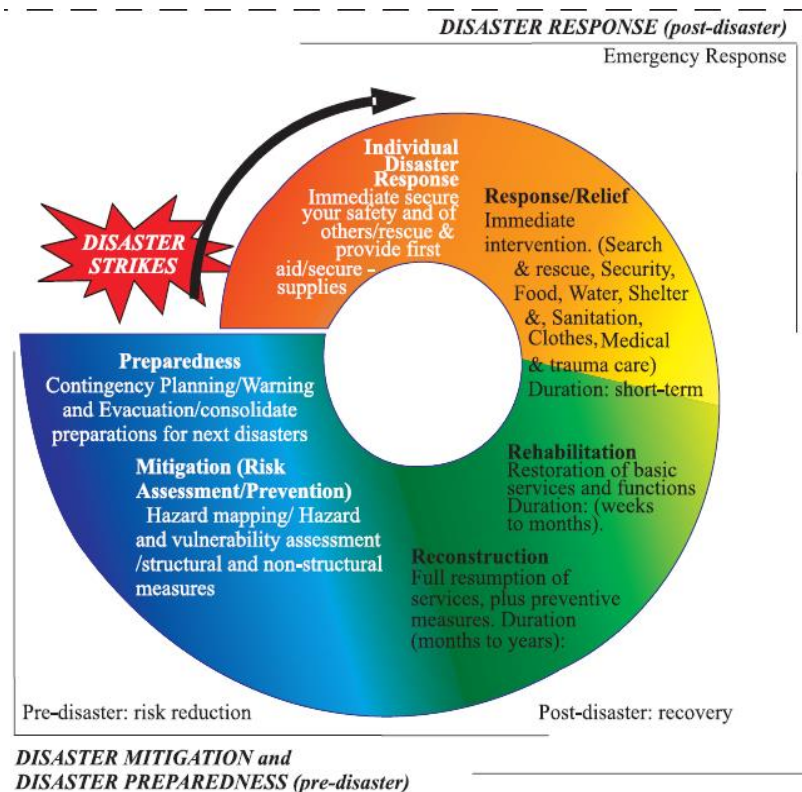
- Predicate preparedness and prevention measures that help the community recover from disaster impact.
- Reduction of hazards faced by the community.
- Creation of awareness of risks at the community level.
- Encourage participation of community to lessen the risks.
- Protection and conservation of natural resources.
- Risk and vulnerability assessment to gauge the risks that the community faces and working out methods of reducing the risks.

### **Early Warning Systems**

Early warning systems used in disaster management should be people centred. To be effective in its functioning, the following four elements should be integrated in it.

1. Knowledge of risk faced by the disaster.
2. Technical monitoring and warning services.
3. Dissemination of meaningful warnings to those at risk.
4. Public awareness and preparedness to act.

Failure in any of these four elements can mean failure of the entire early warning system. Early warning systems are recognized by the Hyogo Framework for Action (HFA). It is as an important element of disaster risk reduction and help protect development gains from increased occurrence and impacts of disasters. The increased occurrence and rise in impact of disasters are due to the increased size and vulnerability of exposed populations. The increased occurrence of disasters may also be due to the increased frequency and severity of some hydrometeorological hazards which arises due to climate change. Early warning systems have always proved to be a critical element in saving lives, property and agricultural assets. Early warning information must be as accurate, timely and as credible as possible so that people can trust it and act on it. People need to know exactly where to go for safety and which route to take.



**Figure 3.2 Disaster Response Activities**

(Source Cartes, Nick, (1991), Disaster Management A Disaster Management Handbook (Cartes, Nick, 1991)).

Scientific forecasts about impending hazards of disasters are usually broadcast on the radio and TV and published in the newspapers. However, disseminating warnings through media needs utmost care. Warnings should be clear with proper interpretations to avoid any misunderstandings thereby creating panic among the common public. Media should take utmost care to provide accurate information to the public. Local governments also play a vital role by providing a vital link between national level warning and communities at risk. While radio and TV may transmit warnings to the most remote parts of the country, it is local governments that must team up with the local Red Cross and Red Crescent branch and NGOs to ensure that the warnings are understood by the population at risk, shelters are ready in case of emergency and evacuation is provided if needed. For the sake of efficiency, early warning systems need to be people centred. The objective of a people centred early warning system is to empower individuals and communities threatened by hazards to act in adequate time and manner to reduce the possibility of personal injury, loss of life, damage to property and the environment, including the loss of livelihoods. The following are the services provided by early warning systems.

**Monitoring and Warning Service** Warning services lie at the core of the disaster management system. They must have a sound scientific basis for predicting and forecasting and must operate 24 hours a day. Continuous monitoring of hazard parameters and precursors is necessary to generate accurate and timely warnings. The coordinated efforts from different hazards warnings should be undertaken to benefit from shared institutional, procedural and communication networks.

**Dissemination and Communication** is important that warnings reach those at risk. All communication must be clear, and care should be taken to provide useful information which would help people to take proper responses. Regional, national and community level communication channels and tools must be pre-identified and a single authoritative voice established. The use of multiple communication channels is important to ensure that the message reaches everyone, and it also acts as guard against any possible failure of a channel. The use of multiple channels helps reinforce the warning message.

**Response Capacity** In order to be effective, communities must respect the warning service and know how to react to warnings. This is possible by providing systematic education to the people and by organizing preparedness programmes led by disaster management authorities. It is essential that disaster management plans are in place and are well practiced and tested. The community at risk should be well informed on options for safe behaviour. The community must also be aware of varied means to avoid damage and loss of property.

### **Disaster Preparedness**

Disaster preparedness is an efficient way to decrease the effect of small as well as large scale disasters. It acts as an effective link between emergency response and rehabilitation. Disasters expose the vulnerability of individuals and communities. They face threat to their lives and their property, infrastructure etc. This spells out the importance of developing disaster preparedness mechanisms and processes to neutralise and reduce the vulnerability of people and minimise loss of lives and property.

The United Nations Disaster Relief Office (LINDRO) defines Disaster Preparedness as "a series of measures designed to organise and facilitate timely and effective rescue, relief and rehabilitation operations in cases of disaster. Measures of preparedness include among others, setting up disaster relief machinery, formulation of emergency relief plans, training of specific groups (and vulnerable communities) to undertake rescue and relief, stock piling supplies and earmarking funds for relief operations."

Disaster Preparedness comprises different sets of activities before, during and after the disaster. Few of those activities are outlined here.

#### **Preparedness Activities before the Onset of Disaster**

- Formulation of disaster preparedness plans at national, state, local and community levels.
- Generation and disseminating information through mass media about the potential hazards, their frequency of occurrence and associated risks.
- Installation of appropriate forecasting and warning systems.
- Strengthening of physical infrastructure.
- Evacuation of people to safer areas.

#### **Preparedness Activities during the Eventuality**

- Provision of food, shelter, medical and first aid services.
- Security arrangements to prevent occurrence of untoward incidents.

#### **Post disaster Preparedness Activities**

- Rescue operations for affected.
- Proper relief distribution including food, clothes and medicines.

- Restoration of communication system.
- Damage assessment and immediate financial assistance.

### **Awareness during Disasters**

Community awareness forms the basic crux of present day disaster management. The prime objective is to raise the awareness levels and knowledge base of the community to make them alert, self-reliant and cope with the consequences. People have coping strategies that they derive from the past experience. The communities possess the capacity and strength arising out of previous experiences in facing emergencies. This needs to be harnessed. The awareness is required to enable the community to understand the impact of disaster, efforts required to reduce its impact and save their lives and property.

### **The Awareness should make the Community Conversant about**

- Operationalising of preparedness or response or emergency plan prevalent at the local or community level.
- Adhering to special instructions about warning and evacuation given during disaster.
- Getting conversant with evacuation procedures, routes for evacuation and necessary things to be taken.
- Providing help to vulnerable sections such as women, children, old, physically challenged etc.
- Mobilising other community members in tackling the crisis.
- Distributing relief

Community awareness in case of cyclone prone areas can include providing information about construction of wind resistant houses, avoidance of loose material such as metal or aluminium sheets, which can be blown away, use of battery-operated communication system etc. Similarly, with regard to flood mitigation, it can include use of water resistant material for flood resistant houses, construction of dykes and embankments, afforestation in catchments areas etc. Mass awareness programmes for drought management can include dry land farming, farm forestry, pasture land management, soil and water conservation techniques.

### **3.3 Application of Information Technology in Disaster Risk Reduction**

Information technology (IT) has “revolutionised communication, bringing within the ambit of connectivity, remote and far flung areas and the illiterate marginalised masses, realised true democracy and enhanced awareness of rights among people and duties among official agencies and the lay public. Knowledge is power; hence ‘empowerment’ is the chief contribution/result of the information communication revolution partaking in the developing world currently.” Specific applications and benefits of IT are discussed by N. Vinod Chandra Menon (2003).

#### **A) Decision Support and Public Awareness**

The World Wide Web and the Internet have opened up possibilities of department specific web sites, which provide information in specialised branches of disaster management. Some of these web sites are accessible to people which disseminate valuable information for interest articulation and academic deliberation in the area. There are specialised web sites on natural hazards such as earthquakes and cyclones that provide comprehensive information regarding specific natural hazards. Such web sites also form ‘knowledge bases’ in that a web site on earthquakes would

present all information on the hazard and ways to deal with it. These form important decision support tools (DCS) that facilitate knowledge transfer during critical times.

## **B) Information Sharing**

The Information Communication Revolution has made possible the setting up of local area and wide area networks known as INTRANETS and EXTRANETS that link up institutions over distant regions and facilitate information sharing on a global basis. The integration of information technology (IT) with telecommunication interfaces has made possible facilities like video teleconferencing which provide for direct interface between aid givers and official agencies at the emergency site, rendering relief and rescue process highly efficient, besides providing for 'knowledge networking' across institutions, especially research institutions during peace times.

Another significant development has been the Geographical Information System (GIS), by which detailed spatial analysis of 'at risk' area is accomplished through satellite imagery. Comprehensive information is collected about the area which is displayed graphically, on a map, highlighting critical facilities and communities at risk, available communication infrastructure etc. which guides immediate disaster response in the short run, and over the long run, facilitates risk mapping, risk assessment, dissemination of information, public awareness etc. which aid long term policy planning for disaster mitigation. The GIS has greatly facilitated response effort as strategies can be devised on the basis of scientific simulation studies and scenario analysis using information made available through remote sensing. The Indian Meteorological Department (IMD) has commissioned a satellitebased communication system called Cyclone Warning Dissemination System for dissemination of cyclone warning in coastal areas.

## **C) Policy Planning**

Information Technology has greatly aided planning for disaster response and preparedness. Information technology has made policy for disaster risk reduction more fact based and less judgemental / 'a priori'. Generally, policy making for traffic, transport, forest conservation, urban congestion etc. is facilitated by spatial imagery through remote sensing.

### **Geoinformatics in Disaster Management (RS, GIS, GPS)**

The problem with traditional manual maps is that they are tedious and time consuming to prepare, difficult to update and inconvenient to maintain. Therefore, nowadays remote sensing is emerging as a popular means of map preparation, and Geographical Information Systems (GIS) can be used for storage, analysis and retrieval. Under remote sensing techniques, maps can be prepared using satellite data or aerial photographs, and are then digitized and stored on computers using GIS software. Once this is done, they can be retrieved and viewed on the computer any time.

"Mapping can be done regarding road and rail links, urban and rural pockets, socio economic profiling, e.g. scheduled castes and scheduled tribes in a region, pockets of intense poverty, degree of vulnerability as per different indices, total resultant vulnerability, categorization on a vulnerability index etc. These maps can be superimposed on each other depending on the context within which specific information is required. This can serve as an important policy tool as techniques get more sophisticated and speedier and effective policy formation as well as implementation is required." (Arora, 2003).



### **Remote Sensing**

Remote sensing (RS) is the science of extracting information about the earth's surface from images acquired at a distance. It differs from aerial photography which deals with only the visible spectrum while RS covers the infrared and microwave regions also. Data from satellites is downloaded in digital form at Earth receiving stations, where they are converted into photographic form. Objectives are differentiated on the basis of differing brightness or colour. Data image processing is a highly technical process involving large scale analysis of data received from image sensors.

### **The Geographic Information System (GIS)**

Disaster management is a multidisciplinary function involving information from various sources. Data obtained from remote sensing has to be studied in conjunction with data from ancillary sources like socio economic data, topography, soil type etc. that is analysed to deduce relevant information. The global positioning system (GPS) has increased the scope of GIS. The GPS is a satellite based radio navigation system that provides real time data to GIS. For example, in earthquakes studies, the GPS may be used to measure the deformations caused by an earthquake. This information along with seismological and other data may be analysed in GIS to locate the source of an earthquake.

### **Disaster Communication Systems (Early Warning and Its Dissemination)**

Warnings on disaster must reach people at risk. Warnings must be clear, and it should contain useful information to enable proper responses from people. Regional, national and community level communication channels and tools must be preidentified and one authoritative voice established. The use of multiple communication channels is necessary to ensure that communication reaches to everyone in case of failure of any one channel. It also aids in reinforcing the warning message.

### **Response Capability**

Communities must also respond properly to the warning service provided by authorities and know how to react to warnings. To achieve this, communities require systematic education and preparedness programs led by disaster management authorities. It is essential that disaster management plans are in place and are well practiced and tested. The community should be well informed on various options for safe behaviour and different means to avoid damage and loss of property.

### **Multi hazard Early Warning Systems**

This system addresses several hazards of similar or different type in contexts and its impacts where hazardous events may occur alone, simultaneously, cascading or cumulatively over time, and considering the potential interrelated effects. A multi hazard early warning system with the ability to warn of one or more hazards increases the efficiency and consistency of warnings through coordinated and compatible mechanisms and capacities, involving multiple disciplines for updated and accurate hazards identification and monitoring for multiple hazards.

### **Land Use Planning and Development**

Land use planning (LUP) is currently considered to be one of the best practices at the core of natural Disaster Risk Management (DRM) that can improve the security and resilience of the people affected. With a LUP policy, a community can consider disaster risks and their spatial distribution, steer more sustainable land development and use, and reduce the vulnerability of poor people who are often settled on degraded sites with significant risks and constraints.

LUP is both a volunteered collective approach and a local authoritative decision making process that integrates natural risks and sensitive social concerns into institutional, communal, customary and legal arrangements. The goal is to establish and enforce prohibitions over disaster prone areas and legal restrictions or alternatives over exercise of land rights. Post disaster rehabilitation programmes and reconstruction projects should also improve land tenure security by enforcing strict development rules and building standards, in accordance with the assessed level of risks at particular sites.

### **Disaster Safe Designs and Constructions**

Disaster resistant construction is one of the core issues at the disaster mitigation and prevention policy levels. Few disaster safe designs are given below.

For earthquake resistant construction, avoiding hillside slopes and areas having sensitive and clayey soil would be better. It is preferable to have several Chapters on terraces rather than one large Chapter with footings at different clusters. The building as a whole should be kept almost symmetrical. Simple rectangular shapes behave better in an earthquake than shapes with multiple projections. Separation of a large building into several Chapters is required for symmetry and rectangularity of each Chapter. Restricting the width of openings, using bond beams and taking recourse to steel or wooden dowels as well as RCC band at plinth, lintel and roof levels are good disaster resistant techniques for buildings.

In case of cyclones, it would be better to erect structures in areas which provide a protective shield from high winds with natural firm level foundation. Flat roof arrangement should be avoided. Projecting elements like antennas and chimneys, eave projections, sunshades etc should also be avoided. The construction should have adequate diagonal bracing, reinforced machinery, thicker plate glass, and anchoring of purloins to gable ends. As far as flood resistant housing is concerned, prohibited zones should be totally avoided. Layout of the buildings/ houses should be such that they do not Chapter free flow of water. Construction should be done on raised mounds. Waterproofing treatment, adequate bracing, afforestation in catchment areas are required for flood prone areas.

### **Structural and NonStructural Mitigation of Disasters**

Mitigation measures are classified as Structural and NonStructural. Structural mitigation measures include building and planning regulations for proper landuse management, guidelines for new constructions based on earthquake mitigation measures and various technical measures of strengthening buildings. Some other examples of structural mitigation measures include construction of dykes to provide protection against river or sea floods (Charlotte Benson). It is important to differentiate between engineered structures and non-engineered structures for better analysis of structural mitigation.

In case of floods, structural interventions include the construction of dykes to provide protection against river or sea floods. In Vietnam such structures have been built and maintained for some 2000

#### **To Do Activity**

Visit any meteorological laboratory or any government office involved in GIS or remote sensing, any engineering institution or scientific laboratory or geography department of the university or private consultancy firm in the field of CIS / remote sensing or newspaper office and attempt to find out about GIs maps. Observe the map and note your observations.

years. Bamboo houses are built in traditional communities to brace against cyclones. In case of earthquakes, classification is attempted between engineered structures and non-engineered structures.

### **3.4 Disaster Risk Transfer and Financing**

Risk financing and risk transfer instruments are meant for reducing financial vulnerability by addressing actual or impending financing gaps. These instruments may reduce the economic costs of disasters by enabling the re-profiling or the transfer of risks, improving government financial planning, and by providing incentives for risk reduction.

These instruments generally involve the operation of insurance, banking and capital markets. One must understand it well to evaluate their cost effectiveness in bridging identified financing gaps.

#### **Risk Financing**

Risk financing comprises the retention of risks in case of a disaster. It is achieved by adopting a clear financing strategy to ensure that adequate funds are available to meet the financial needs in such a situation. Such financing can be established both internally and externally. Internally it is established through the accumulation of funds set aside for future use and externally through prearranged credit facilities. The banking sector, capital markets and international lending institutions function as different sources of risk financing.

#### **Risk Transfer**

Risk transfer involves the shifting of risks to others by paying a premium. When a disaster occurs, they provide compensation ensuring that any financing gap that might emerge is partially or fully bridged. Risk transfer may be obtained through different means like insurance policies or capital market instruments such as catastrophe bonds. The main sources of risk transfer are insurance and reinsurance sectors and in some cases capital markets act as an alternative source. The payouts of risk transfer instruments may be quantified on the basis of actual losses sustained by the protection buyer (indemnity based), or the amount of such payment may be agreed upon by the parties irrespective of actual losses and triggered by a physical parameter measuring the intensity of the hazard at given locations (parametric) or by an index comprising multiple measurements of such parameters for each event (parametric index).

Where risk financing and risk transfer markets are domestically well developed or can be accessed on a cross border basis, those facing disaster risk need to evaluate whether, given their degree of financial vulnerability, to retain risks and fund them solely on an ex post basis within existing financial capacities or whether to manage risks ex ante through risk financing, risk transfer or additional risk reduction measures based on their costs and benefits.

If disaster risks are relatively minor in comparison with risk bearing capacity, managing these risks solely on an ex post basis may be a viable approach, allowing funds to be more productively invested elsewhere, supporting capital accumulation and thus augmenting financial capacity. However, if disaster risks are material, ex ante financial tools can provide valuable protection, helping to bridge financing gaps; alternatively, investment in risk reduction may yield benefits in terms of a reduced risk exposure. These measures require, however, an ex ante commitment of resources, with attendant opportunity costs given alternative uses of capital. Building up a dedicated pool of savings or reserves,

a source of risk financing obtained through internally generated funds which are set aside in a disaster fund and are drawn down in the event of a disaster, may prove valuable for those with relatively low disaster risk exposures, for instance for more frequent but lesser impact hazards.

As disaster risk increases relative to risk bearing capacity, accessing external sources of risk financing such as contingent credit facilities, where loans are provided in the event of a disaster event, may be more efficient, as it may be more difficult to build up the necessary amount of internal funds to meet the increased expected costs of disasters and such funds might be more productively invested elsewhere.

Insurance may provide beneficial protection for those facing larger disaster risks relative to risk bearing capacity. Insurance permits risks to be transferred to undertakings, namely insurers and reinsurers, whose business is to pool and diversify risks. For households and other economic agents with limited expertise and resources and facing material disaster exposures, the purchase of insurance can – in those countries where insurance markets are well developed – provide simple and cost effective financial protection. The same may apply to larger economic agents such as large corporations and governments. Alternatively, simplified risk transfer tools such as micro insurance and parametric insurance products may be deployed in countries where insurance markets are not well developed or broad based.

As the severity of the risks further increases and size of the risk bearer increases, enabling direct access to capital markets, additional risk transfer tools may become accessible, such as catastrophe linked securities, which involve risk transfer through capital markets. In a limited number of cases, countries have used catastrophe linked securities to cover higher layers of risk in the context of structured disaster risk financing (e.g., a disaster fund) or risk transfer (e.g., an insurance scheme) mechanisms. Opportunity costs linked to ex ante financial tools may rise with the size of the risk bearer given that investment opportunities and investment management capacities may increase.

Investment in risk reduction will yield both economic and social benefits, such as avoidance of loss of life and injury, as well as help to reduce overall country risk. Risk reduction measures can directly substitute for, or complement, financial tools. If disaster risks are large, then initial investments in risk reduction are likely to yield substantial benefits; however, there are likely to be diminishing returns as such investment increases. At the level of an individual household or small business, the scope for risk reduction may be limited compared to what might be achieved by a large corporation or government.

Disasters lead to a number of direct and indirect financial impacts on governments, businesses and individuals. Post disaster financial needs are often defined by three phases (a) immediate relief and rescue response, (b) early recovery and (c) the reconstruction phase.

Funding needs will differ in each phase. Relief and rescue require immediate access to funds for urgent rescue, food, medicine, clean water and shelter for those injured, affected and displaced. Early recovery requires funding, within weeks, to restore livelihoods, help communities return to some level of normality and restart their economic activities. Reconstruction requires more substantial funds to be mobilized for repairing and rebuilding damaged assets such as homes and critical infrastructure. Funds are therefore required on different timescales. Delays in receiving funding can hamper each phase, negatively impacting the population and the economy.

The development of a successful risk financing and risk transfer programme requires the collaboration of multiple stakeholders and information providers. Risk assessments and development of sovereign risk financing and risk transfer programmes should engage a variety of stakeholders from the government (relevant ministries), national technical agencies and data providers, academia and centres of excellence, (re)insurance industry, international and regional development banks, nongovernmental organizations and the risk modelling community.

### **Risk Financing in India**

The policy arrangements for meeting relief expenditure related to natural disasters are primarily based on the recommendations of successive Finance Commissions. The two main windows presently open for meeting such expenditures are the Calamity Relief Fund (CRF) and National Calamity Contingency Fund (NCCF). The Calamity Relief Fund is used for meeting the expenditure for providing immediate relief to the victims of cyclone, drought, earthquake, fire, flood and hailstorm. Expenditure on restoration of damaged capital works should generally be met from the normal budgetary heads, except when it is to be incurred as part of providing immediate relief, such as restoration of drinking water sources or provision of shelters etc., or restoration of communication links for facilitating relief operations. The amount of annual contribution to the CRF of each State for each of the financial years 200001 to 200405 is as indicated by the Finance Commission. Of the total contribution indicated, the Government of India contributes 75 percent of the total yearly allocation in the form of a non plan grant, and the balance amount is contributed by the State Government concerned. A total of Rs.11,007.59 crores was provided for the Calamity Relief Fund from 200005.

Pursuant to the recommendations of the Eleventh Finance Commission, apart from the CRF, a National Calamity Contingency Fund (NCCF) Scheme came into force with effect from the financial year 200001 and would be operative till the end of the financial year 200405. NCCF is intended to cover natural calamities like cyclone, drought, earthquake, fire, flood and hailstorm, which are considered to be of severe nature requiring expenditure by the State Government in excess of the balances available in its own Calamity Relief Fund. The assistance from NCCF is available only for immediate relief and rehabilitation. Any reconstruction of assets or restoration of damaged capital should be financed through reallocation of Plan funds. The initial corpus of the National Fund is Rs.500 crores, provided by the Government of India. This fund is required to be recouped by levy of special surcharge for a limited period on central taxes. Assistance provided by the Centre to the States from the National Fund is to be financed by levy of a special surcharge on the central taxes for a limited period. A list of items and norms of expenditure for assistance chargeable to CRF / NCCF in the wake of natural calamities is prescribed in detail from time to time. There are a number of important ongoing schemes that specifically help reduce disaster vulnerability. Some of these are Integrated Wasteland Development Programme (IWDP), Drought Prone Area Programme (DPAP), Desert Development Programme (DDP), Flood Control Programmes, National Afforestation & Eco-development Programme (NA&ED), Accelerated Rural Water Supply Programme (ARWSP), Crop Insurance, Sampurn Grameen Roger Yojana (SGRY), Food for Work etc.

The High Power Committee (HPC) constituted by GOI on Disaster Management which submitted its report in October 2001 recommended that at least 10 percent of plan funds at the national, state and district levels be earmarked and apportioned for schemes which specifically address areas such as prevention, reduction, preparedness and mitigation of disasters. The Eleventh Finance Commission

too paid detailed attention to the issue of disaster management and, in its chapter on calamity relief, came out with a number of recommendations, of which the following have a direct bearing on the Plan

- a. Expenditure on restoration of infrastructure and other capital assets, except those that are intrinsically connected with relief operations and connectivity with the affected area and population, should be met from the plan funds on priority basis.
- b. Medium and long term measures are devised by the concerned Ministries of the Government of India, the State Governments and the Planning Commission to reduce, and if possible, eliminate, the occurrences of these calamities by undertaking developmental works.
- c. The Planning Commission, in consultation with the State Governments and concerned Ministries, should be able to identify works of a capital nature to prevent the recurrence of specific calamities. These works may be funded under the Plan.

In order to move towards safer development, development projects should be sensitive towards disaster mitigation. With the kind of economic losses and developmental setbacks that the country has been suffering year after year, it makes good economic sense to spend a little extra today in a planned way on steps and components that can help in prevention and mitigation of disasters, than be forced to spend more later on restoration and rehabilitation. The design of development projects and the process of development should take the aspect of disaster reduction and mitigation within its ambit; otherwise, the development ceases to be sustainable and eventually causes more hardship and loss to the nation.

#### **To Do Activity**

As a team manager, identify the skills and qualities required amongst team members to discharge activities in any disaster phase and make a brief report. Break this team into planning, operations, information management, and financial administration sections. Identify skills required for each of these functions.

Approach any agency involved in disaster management activity and examine the problems that are encountered in a team work.

### **3.5 Role of Various Stake Holders during Disasters**

#### **Role of Print and Electronic Media during Disasters**

Local media often plays a critical role in providing information during disasters; however, they receive very little help from outside. In rural areas, most people give preference to the radio. The media's role in disaster risk reduction derives from the need to inform, educate and empower communities with relevant knowledge for influencing public actions and policies towards disaster preparedness and mitigation. Reduction of risks at all stages involves proper exchange of information. Today media plays a vital role in spreading information to a larger audience. In Central Asia, and especially in Kazakhstan, media have played an increasing role to convey disaster risk reduction messages. Stronger cooperation between media and the disaster risk reduction community in Central Asia would clearly benefit the population and should be encouraged.

Media can play different roles at each stages of disaster risk reduction process. In predisaster phase, the primary role of the media is to emphasize the importance of disaster risk reduction and disaster

preparedness. It should encourage decision makers and at-risk communities to undertake appropriate actions to avoid future disasters. Media can do this by highlighting potential sources of risk or vulnerabilities, analysing risk patterns and educating communities about measures they can undertake at family, community and organizational levels to mitigate hazards and reduce their vulnerability.

#### **Media can use different Ways to Reach the Public. Some of these ways may Include**

- **Skilfully Produced Radio or TV Programmes** Such programmes can go beyond simple exchange of information by using entertaining soap operas to promote greater awareness of risk such as earthquakes or infectious diseases. In Tajikistan, a “Radio Theatre for Children” has been used, and in Afghanistan, the evaluation of a long running radio soap entitled “New Homes and New Life” proved that listeners change their attitudes and behaviour after hearing the drama (Source World Disaster Report, IFRC 2005).
- **Organize Dialogues with Local Experts** Dialogue among experts on the causes of disasters, risk and vulnerabilities and on the identification of appropriate solutions would play an important role in focusing communication among stakeholders on disaster problems and also in raising public awareness. Therefore, media should consider holding forums among representatives of scientific organizations’. The Meteorological Department and other government departments, local NGOs, national societies of the Red Cross and Red Crescent and UNDP.
- **Public Auditing** Media can conduct surveys and opinion polls to rate the relevance, quality and quantity of the relief and rehabilitation assistance.
- **Research Articles and Programmes** Media professionals can conduct research on specific issues such as risk generation factors in communities and publish them in newspapers or on radio/TV broadcasts.
- **Interviews** Media can interview disaster management officials, e.g. the Director of the National Disaster Management Office, the President of the National Society of the Red Cross and Red Crescent Society, etc.
- **Field Visits** Media professionals can cover the plight of the vulnerable or disaster affected people to advocate for disaster risk reduction or the provision of appropriate relief and rehabilitation.
- **Warning and Preparedness Message Dissemination** When the hazard season is approaching, media can publish and broadcast warnings and preparedness messages to inform the general public about the risk and possible disasters they may face and actions they may take to avoid or minimize the loss of life and property.

#### **Community Based Disaster Risk Reduction**

The goal of any disaster management initiative is to build a disaster resistant/resilient community equipped with safer living and sustainable livelihoods to serve its own development purposes. The community is also the first responder in any disaster situation, thereby emphasising the need for community level initiatives in managing disasters. To encourage such initiatives, the following are the measures required

- a. Creating awareness through disaster education and training and information dissemination are necessary steps for empowering the community to cope with disasters.



- b. Community based approach followed by most NGOs and Community Based Organisations (CBOs) should be incorporated in the disaster management system as an effective vehicle of community participation.
- c. Efforts are needed to identify the most vulnerable groups like women and children, aged and infirm and physically challenged people who need special care and attention and provide special assistance in terms of evacuation, relief, aid and medical attention to them.

### **Health Issues and Hospital Preparedness and Response**

Disaster management involves the joined effort from different community resources—from police and fire to medical providers, structural and environmental engineers, and transportation and housing experts. The hospital has a crucial role to play during disasters. It is the epic centre of medical care delivered to those who are injured. Preparing a hospital during disaster is more complicated.

“Because of the unpredictability of demand for emergency services, hospitals face fluctuations in utilization on an hourly, daily, and weekly basis. With many hospitals already operating at or near full capacity, temporary surges can exacerbate chronic ED crowding, boarding, and ambulance diversion. While these surges in demand can severely stretch the resources of a hospital’s staff and diminish the quality and safety of patient care, hospitals generally maintain their normal standard of care through these surges. In a disaster situation, however, hospitals may need to shift to a sufficiency of care mode, in which the focus is on saving as many lives as possible rather than ensuring that each patient receives the usual standard of care” (AHRQ, 2005). In the most extreme cases—for example, a full blown influenza pandemic such as that experienced worldwide in 1918—this could mean assigning the most severely ill or injured patients to expectant care, a strategy that withholds treatment for those who have very little chance of survival to focus resources on saving the largest possible number of lives.

### **Capacity Building**

Capacity building is the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time. The concept of capacity building for managing and reducing disaster risk is highlighted extensively in the Hyogo Framework for Action 2005-2015. The framework calls for accelerated efforts to build community and national level capacities to manage and reduce risk, and link these efforts to all five priority areas of action. For example

1. Ensuring that disaster risk reduction is a national and local priority with a strong institutional basis for implementation. It requires building institutional capacity through the development of policy, legislative and institutional frameworks.
2. Identifying, assessing and monitoring disaster risks and enhancing early warning. It requires developing scientific, technological and technical capacities to observe, analyse and forecast disasters, and institutional capacities to integrate early warning systems into local and national level processes and systems.
3. Using knowledge, innovation and education to build a culture of safety and resilience at all levels and it requires supporting and building technical capacity to assess impact and vulnerability, improve monitoring and evaluation, and promote communitybased education.
4. Reducing underlying risk factors requires integrating DRR planning and capacity building into multiple sectors including the health sector (so that health care remains functional during

disasters), and housing and construction sectors (to ensure that structures are resistant to disasters through new building codes, standards and practices)

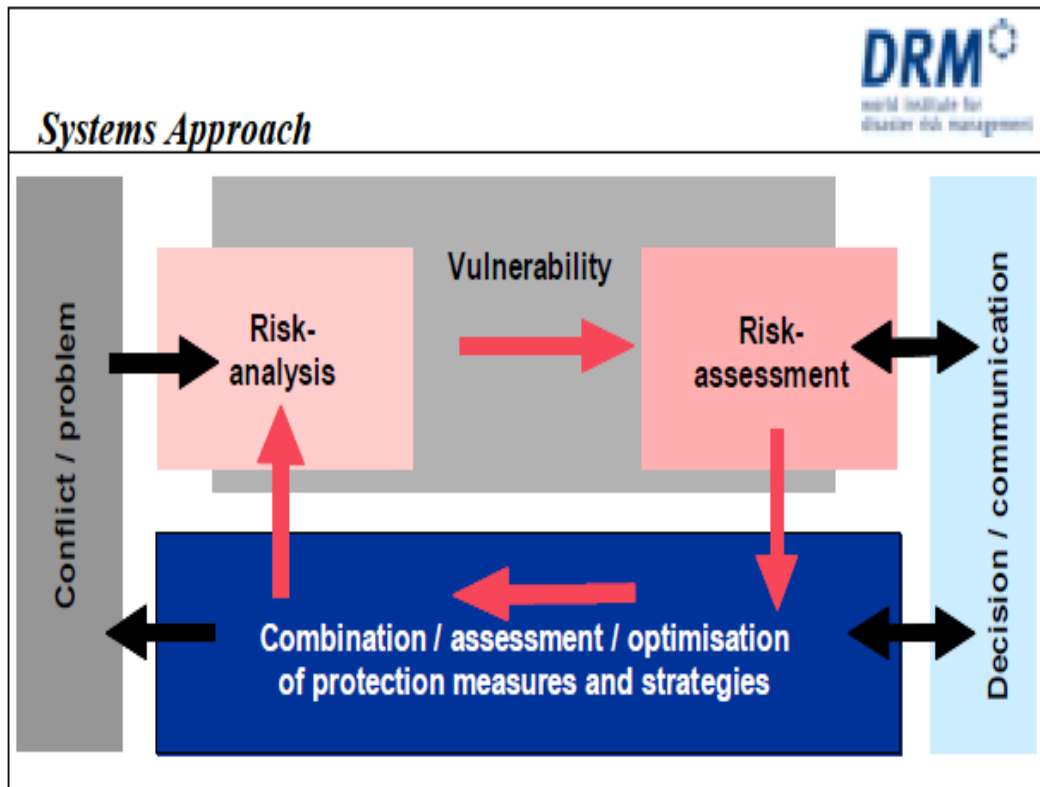
5. Strengthening disaster preparedness for effective response at all levels requires equipping institutions, individuals and communities in disaster prone areas with the necessary knowledge, skills and capacities to manage and reduce disaster risk.

A recent literature review on capacity building for DRM highlights a number of key enablers of and barriers to effective capacity building (CB) interventions

- CB programmes must be locally 'owned' and are most effective when they are led by national actors, with a limited role for external actors
- CB should relate to the local context, be rooted in a strong understanding of the country's formal and informal institutional environment, and should build on resident capacities
- CB is not just a technical exercise the wider political and governance environment critically affects CB success
- CB requires a multi stakeholder, multidimensional approach involving different levels of government, different actors and different sectors
- High staff turnover impedes sustainability of CB
- Donor practices can create perverse incentives for CB, particularly through the imposition of short timescales for projects and pressure to spend money quickly
- Long time horizons are ideal for DRM CB interventions, although there is typically a key window of opportunity and momentum immediately after a disaster
- Careful design is required to ensure effectiveness, including the use of needs assessments, defined objectives, theories of change, a comprehensive plan, and an exit strategy
- Be aware of barriers to participation in CB activities to ensure that vulnerable communities are able to participate in programme design
- CB interventions should be based on equality where all the actors are on a shared learning journey. For this reason many national governments prefer South approaches and triangular cooperation.

### **Systems Approach in Disaster Management**

The starting point of an integral risk management concept is the relation between hazard, vulnerability, risk and risk management. The approach of the World Institute for Disaster Risk Management (DRM) includes the systems approach (e.g. Wilhelm, 1999).



**Figure 3.4 Systems Approach for Disaster Risk Management**

Source The World Institute for Disaster Risk Management (DRM) (Wilhelm, 1999).

The model links together the elements risk analysis, vulnerability, and risk assessment. It requires the development of tools for an overall risk mitigation. The development of methods and measures to support prevention and intervention activities such as monitoring, registration, forecasting, early warning, and decision supporting tools for frontline decisions becomes particularly important.

Efficient risk management requires a careful evaluation of the vulnerability of the objects and of the systems at risk. Cost benefit analyses of prevention measures can only be performed on the basis of a quantitative evaluation of possible damage to structures and entire systems

Firstly, the fundamental relationship between natural and manmade risks and the process of globalisation is estimated in terms of three elements

- a. Interdependence between disaster and economic development
- b. Interdependence between disaster and sustainability
- c. Interdependence between disaster and resource allocation (especially capital and technology).

Secondly, the principles of welfare theory are needed to understand the precautionary measures. Finally, institutional arrangements should be taken care of for the implementation of long term strategies of risk prevention.

### **Disasters, Climate Change and Ecosystems**

The impacts of climate change on society are occurring earlier and more frequently than predicted (IPCC 2012). "Climate change impacts such as floods, drought, heat waves and increased intensity and frequency of storms have been the major cause of long term increases in economic losses (IPCC 2012).

Projected population increases and urbanization are increasing vulnerability and disaster risk by placing additional development pressures in zones that are most sensitive to climate change impacts, including coastal systems and low lying areas (Field et al. 2014).

Ecosystems and biodiversity provide services essential for helping people adapt to the impacts of climate change and disaster risks. In recent years, “ecosystem based adaption” (EbA) and “ecosystem based disaster risk reduction” (EcoDRR) have gained increasing attention in risk management. These approaches emphasize the importance of ecosystems in effective climate change adaptation (CCA) and disaster risk reduction (DRR) measures, and build on other practices such as conservation and ecosystem restoration that seek to increase the resilience of ecosystems. EbA and EcoDRR have gained traction because they provide multiple benefits for people, ecosystems and biodiversity, enable planning for CCA and DRR on longer time scales, are costeffective compared to traditional engineered infrastructure, and emphasize community participation and the use of traditional and local knowledge systems. Due to their participatory nature and crosssectoral approaches to adaptation and disaster risk reduction, EbA and EcoDRR can achieve multiple policy objectives, including local, regional and national strategies for climate change, disaster risk reduction, and sustainable development, among others.

Major international agreements such as the Paris Agreement and the Sustainable Development Goals have called for enhancing the resilience of ecosystems and societies to the impacts of climate change and disaster risk. Increasingly, countries are integrating ecosystem based approaches into national plans and strategies to reduce the risk of climate impacts and hazards – examples have been synthesized in CBD Technical Series No. 85 (Lo 2016). However, there remains a gap between policy development and implementation. The objective of these guidelines is to support and enable the design and implementation of EbA and EcoDRR strategies as part of an overall climate change adaptation or DRR strategy, on multiple scales short, medium and longterm, and local, subnational and national.



**Figure 3.5 Adaptation and Disaster Risk Reduction Options Within an Overall Adaptation Strategy (GIZ 2015)**

## Ecosystems Based Management for Disaster Risk Reduction and Resilience

The new approach in disaster management known as ‘ecosystem approach to disaster risk reduction (Ecodrr)’ has displayed tremendous benefits. This approach is community based and it emphasises on livelihood, health and food security within the framework of vulnerability reduction. The planning framework at district level suggests an integrated district plan and opens avenue for a much awaited ‘environmental action plan’ mandate at state, district and local levels. This shall help facilitate the DRR infusion with sustainable development agenda in much acceptable sense – in the governance as well as in community actions. It aims at reducing externality in dependence, improving selfreliance and local strengths for disaster mitigation and preparedness.

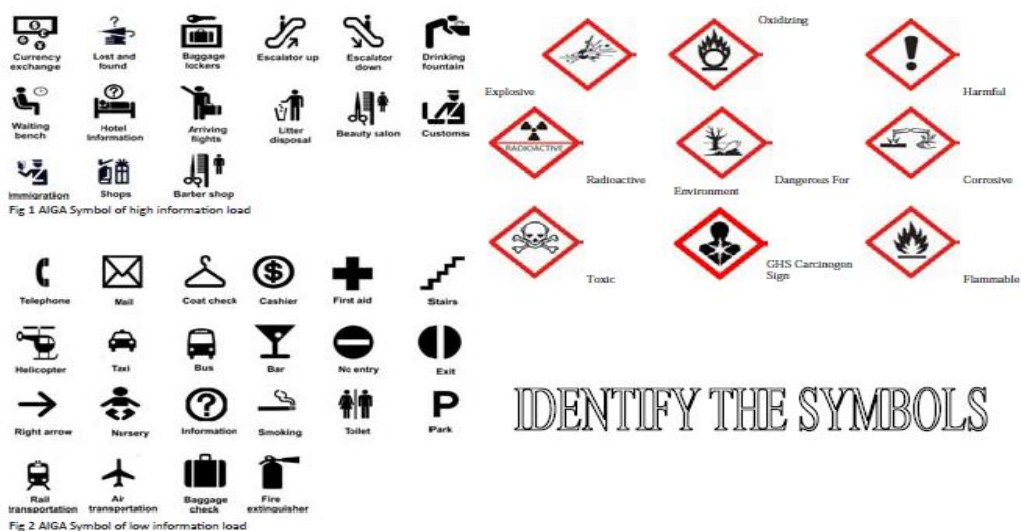
India has initiated the ‘Environment Based Disaster Management Module’ in 2009 at National Institute of Disaster Management in addition to ‘climatechange and disaster management’ module launched in 2007. Globally the disaster management initiative was formalized as an agenda during UNPEDRR (Partnership for Environment and Disaster Risk Reduction) meeting at UN Campus in Bonn in 2010.

The 2004 Indian Ocean tsunami triggered global interest in promoting ecosystem management approaches for reducing disaster risk, placing increased international attention on the role of coastal ecosystems as natural shields against coastal hazards and resulting in major initiatives such as the Mangroves for the Future (MFF) Programme. In 2005, the Hyogo Framework for Action (HFA)4, the first global agreement on disaster reduction, recognized the importance of sustainable ecosystems and environmental management in reducing disaster risk. Both the 2009 and 2011 Global Assessment Report on Disaster Reduction identified ecosystems decline as a major driver of risk and called for

### To Do Activity

Identify the following symbols. Improve your awareness on disaster management and try to bring awareness in your community

greater protection and enhancement of ecosystem services. Ecosystem management for disaster risk



reduction has been prioritized in both the 2009 and 2011 ISDR Global Platform for Disaster Risk Reduction.

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# Chapter 4 Disaster Management in India

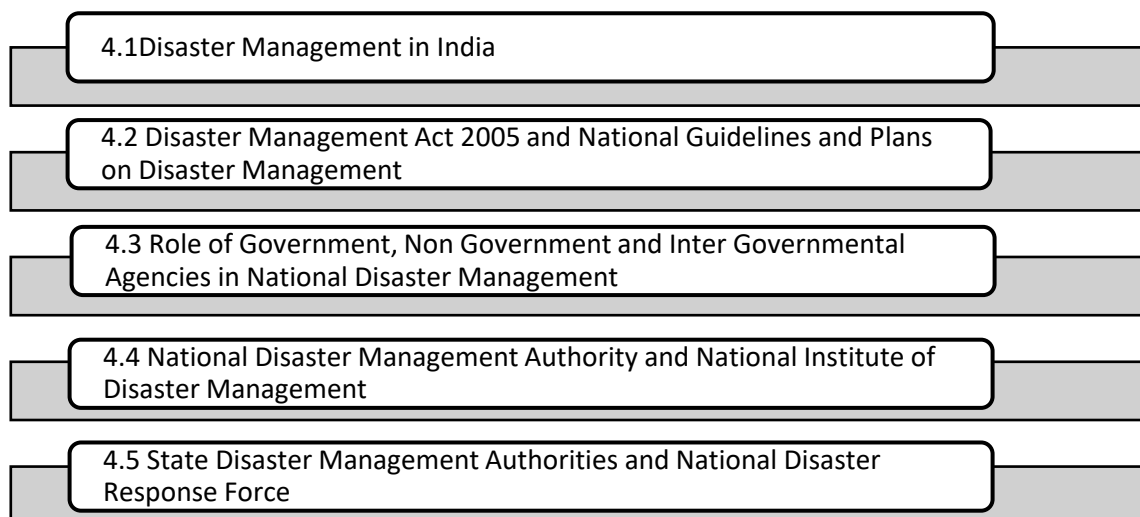
## Introduction

This chapter is dedicated to the concept of disaster management in India. More precisely, this chapter will provide an overview of disaster management in India and its framework. This chapter deals with the disaster management act 2005 and also explains the national guidelines and plans on disaster management. The role of government, nongovernment and intergovernmental agencies and other institutional arrangement during disasters is clearly discussed.

## Objectives

- To discuss the concept of disaster management in India.
- To explain the disaster management act 2005 and the national guidelines and plans on disaster management.
- To understand the role of government, nongovernment and intergovernmental agencies and other institutional arrangement during disasters.

## Structure



## 4.1 Disaster Management in India

Disaster Management discusses how a maximum number of lives and property can be protected during a natural disaster. “Disaster management plans are usually multilayered with an aim to address issues such as cyclones, hurricanes, floods, fires, mass failure of utilities and also spread of an epidemic. India, because of its unique geoclimatic conditions is vulnerable to the natural disasters. Floods, droughts, cyclones, earthquakes and landslides occur recurrently. In India about 59% of the land is susceptible to earthquakes of various moderations; 69 % of the land mass is at risk of drought; 8% of the land area is susceptible to cyclones and over 40 million hectares is at risk of floods. Over a decade from 1990-2000 almost 30 million people got affected by disasters and an average of about 4344 people had lost their lives every year. There has been a huge loss coming to public, private and community assets.



The United Nations General Assembly, in 1989, declared the time period between 1990-2000 as International Decade for Natural Disaster Reduction with an aim to reduce the loss of lives and assets and control socioeconomic damage by taking combined international action in developing countries. At the global level also there has been a substantial concern over natural disasters. Even after making significant progress in the science, technology and infrastructure, the number of loss of lives and property have not reduced. In fact, the number of people who lost their lives and the cost of physical and socioeconomic damage has increased.

With the occurrence of Bhuj earthquake in January, 2001 in Gujarat and the super cyclone in October, 1999 in Odissa, the need for a multidimensional effort was emphasized. This effort involved working on diverse scientific and engineering processes and also financial and social processes. The need for a multisectoral and multidisciplinary approach arised and risk reduction got incorporated in the developmental plans and strategies.

### **Conventional Response to Disasters**

In ancient India, natural calamities like droughts were managed effectively by using conventional water conservation methods, these methods are working and still in use in most parts of Rajasthan and certain other parts of the country. Local communities have come forward and devised local safety mechanisms and farming methods which are drought oriented, in several parts of our country. The Seventh Schedule of the Indian constitution, which lists all the subjects concerned to Central and State government has not mentioned the subject of disaster management in any of its three lists. After India got independence, it was mentioned in the five year plans about how to lessen the effect of disasters like droughts and floods; schemes such as the Drought Prone Area Program (DPAP), Desert Development Program (DDP), National Watershed Development Project for Rain fed Areas (NWDPA) and Integrated Water Development Project (IWDP) are examples of this conventional paradigm (Planning Commission, 2002).

### **Recent Changes**

In India, in the late 1990s and the starting of this century, the management of disaster has seen a diminishing ratio in its efficiency of handling disasters. The Gujarat Earthquake and Orissa Super Cyclone taught the nation a hard lesson. The state, voluntary segment and the communities at large helped in commencing the planning process concerning to disaster preparedness and mitigation of disasters. A High Powered Committee on Disaster Management in 1999 was setup as a welcome step, which submitted its report in 2001. The committee made an important recommendation of allocating 10% of funds of national, state and district levels be allocated for schemes referring to prevention, reduction, preparedness and mitigation of disasters. Also, a special chapter with the title 'Disaster Management The development perspective' was mentioned for the first time in the planning history of India, in the tenth five year plan document (Planning Commission, 2002).

Institutions such as Ministry of Home Affairs (Disaster Management Division), National Institute for Disaster Management (New Delhi), Gujarat State Disaster Management Authority (GSDMA), Orissa State Disaster Management Authority (OSDMA), Disaster Mitigation Institute (Ahmedabad) were some of the institutions which were setup with the objective of completely focussing on disaster management. State governments also have put effort to mainstream disaster mitigation initiatives in the rural development schemes. The Ministry of Rural Development and the Ministry of Home Affairs have come together and put a combined effort in changing the guidelines of schemes such as Indira

AwazYojna (IAY) and Sampoorn Grameen RojgarYojna (SGRY) so that the houses which are constructed under IAY scheme and school buildings or community buildings which are constructed under SGRY scheme are earthquake/cyclone/flood resistant.”

In the past 2 years, there has been a significant paradigm shift in the approach of the Government of India towards disaster management. The new approach proceeds with the belief that development cannot be sustained unless disaster mitigation methods are built into the development process. Another important aspect of the approach is that disaster mitigation has to be multidisciplinary and it has to cover all the sectors of development. The new policy also emanates on the belief that investments which are done in mitigation are much more cost effective than the expenditure on relief and rehabilitation process.

Disaster management occupies an important place in this country's policy framework as it is the poor and the underprivileged who are worst affected on account of calamities/disasters. The steps being taken by the Government emanate from the approach outlined above. The approach has been translated into a National Disaster Framework (roadmap) covering institutional mechanisms, disaster prevention strategy, early warning system, disaster mitigation, preparedness and response and human resource development. The National Disaster Framework identifies and lists all the expected inputs, the areas of intervention and the agencies which are to be involved at the National, State and district levels. This roadmap is shared with all the State Governments and Union Territory Administrations. The ministries and departments of Government of India, and the State Governments/Union Territory Administrations have been advised to design and develop their own roadmaps by taking the national roadmap as a guideline. There is now a common action strategy which has been taken by all the participating organisations/stakeholders.

PM Narendra Modi released the first Disaster Management Plan of India on 1 June 2016 that seeks to provide a framework and direction to government agencies for prevention, mitigation and management of disasters. This is the first national plan since enactment of the Disaster Management Act of 2005. The Disaster Management Act, 2005 (23 December 2005), was passed by the Rajya Sabha on 28 November, and by the Lok Sabha, on 12 December 2005. It received Disaster Management Plan Act the assent of The President of India on 9 January 2006. National Disaster Management Authority (NDMA) is an agency of the Ministry of Home Affairs whose primary purpose is to coordinate response to natural or manmade disasters and for capacity building in disaster resiliency and crisis response. NDMA was established through the Disaster Management Act enacted by the Government of India in December 2005. The Prime Minister is the ex-officio chairperson of NDMA. The Authority agency is responsible for framing policies, laying down guidelines and best practices and coordinating with the State Disaster Management Authorities (SDMAs).”

### **The National Disaster Management System**

India has been traditionally vulnerable to natural disasters because of its unique geo-climatic conditions. “The history of disasters has demonstrated the multi-hazard scenario in the country. The main hazards that are experienced in the parts of country include earthquakes, cyclones, floods, tsunamis, landslides, forest fires, drought, etc. Such natural events have often turned into disasters causing significant disruption of socioeconomic life of communities leading to loss of life and property.

After the Independence to India, the Union Home Ministry has taken the responsibility of looking at the management of natural disasters. Initially the disaster management task was implemented by the Ministry of Agriculture after setting up of the National Disaster Management Division [NDM]. In February 2002, The Ministry of Home Affairs was assigned the roles and responsibility of Disaster Management at the National Level. The major change in the strategy is a paradigm shift from the culture of Response to the culture of Preparedness/Mitigation.

In the national and state levels various roles and responsibilities have been assigned. India has administrative machinery for management of disasters at all the levels of national, state, district as well as sub-district level. The Ministry of Home Affairs, Government of India handles disaster management, it is the nodal Ministry for all matters related to disaster management. The Department of Agriculture and Cooperation is the nodal ministry in managing the drought. Chemical disasters are looked after by The Ministry of Environment and Forests. The Central Relief Commissioner in the Ministry of Home Affairs is the nodal officer in carrying out all the relief operations for natural disasters. Each of the Ministries has been assigned a specific group in the management of a disaster. [Table4.1]

**The New Vision Adopted for Disaster Management Comprises of the Following Concerns**

- Preparedness rather than Crisis Management.
- Coordinated participatory approach rather than only state responsibility.
- Technology up gradation and deployment.
- Information as a tool for disaster management.
- Recognition of linkages between natural disasters and development.
- Connecting specific programs in the management of natural disasters.
- Highlighting on forecasting and warning using advanced technology.
- Preparedness and Mitigation through specific Plan Programs.
- Disaster management as a continuous and integrated part of development process.”

**Table 4.1 Ministries at National Level and the Task Allocations**

Type of Disaster	Nodal Ministry
Natural Disaster	Ministry of Home Affairs
Drought Relief	Ministry of Agriculture
Air Accidents	Ministry of Civil Aviation
Railway Accidents	Ministry of Railways
Chemical Disasters	Ministry of Environment
Biological Disasters	Ministry of Health
Nuclear Disasters	Department of Atomic Energy

(Source Disaster Management The Development Perspective, An extract of the chapter in the tenth five year plan document [20022007], Government of India, Ministry of Home Affairs, National Disaster Management Division).

The framework of disaster management under the new vision with the culture from relief to prevention is expected to undertake following arrangements

- “Encourage disaster mitigation and prevention.
- Establish Institutional mechanisms to ensure coordinated efforts between various governments for disaster management.
- Disaster Management to be listed in List – III – [Concurrent List] of Seventh Schedule of the constitution.
- Each of the states to draft the State Disaster Management Act.
- States to enunciate policy on disaster management.
- Governments at various levels to ensure the formulation and implementation of disaster management codes.
- Early warning systems to be developed at all levels, with the establishment of emergency operations centers.
- Institutionalize knowledge and lessons learnt in the process of working on the national roadmap.

## **Strengths and Weaknesses of the National Disaster Management System**

### **Strengths**

#### **1. From Relief to Prevention**

One of the major strong points of the current national disaster management system is the paradigm shift from relief management system to the development of prevention system. The system ensures that the relief departments at state and national level be termed as disaster management units/ departments. With the new terminology the tasks of these departments at various government levels has been allocated to disaster preparedness, the development of databases to support functionaries in case of disaster/emergency situation. Thus , there has been a significant change in the development of prevention methods rather than relief methods.

#### **2. Sustainable Development**

The past events of disasters such as earthquake of 1993 at Latur, cyclone of 1999 at Orissa, earthquake of January 2001 at Bhuj, etc have demonstrated that after every such a disaster, a large part of the country's as well as state economy is lost in the relief and response actions. With this view, the national disaster management system promotes every state to ensure annual allocation for disaster preparedness. Sustainability has been referred to as the key word in the development of disaster management process. The Ministry of Home Affairs, Government of India along with international organizations such as UNDP, USAID, AUSAID, Government of Japan, European Union, etc has introduced various programs at national and state levels on management of a disaster in order to ensure the capacity building at all levels, and making the community to participate in the multi-hazard preparedness in all the states.

#### **3. Mass Awareness Amongst Communities**

The national disaster management system encourages the state governments to undertake large scale preparedness measures such as awareness generation among people. Most of the state governments have started mass awareness generation programs on disaster management in different ways with the help of voluntary organizations such as Nehru Yuva Kendra Sanghatan, National service scheme, etc. For example, In the state of Orissa ,under

the Govt. of India UNDP India, Disaster Risk Management Program, about 81,847 sensitization meetings were held to generate awareness among people about flood and cyclone management.

### Weaknesses

- **Lack of Coordination Amongst Stakeholders**  
The earthquake of January 26, 2001 at Gujarat affected both life and economy significantly. The disaster demonstrated that there is a need of a long term vision, with appropriate involvement of different stakeholders. Though various agencies provided a large scale support through tangible goods, financial support, human support, etc., the relief and immediate response activities demonstrated the lack of coordination amongst these agencies and stakeholders because of insufficient set operating procedures in case of such a mass disaster.
- **Noncompliance of Norms on Safe Construction Practices**  
The earthquake which occurred in January,2001 in Gujarat state put into picture the wide spread damages of both the types of engineered and nonengineered buildings in the affected region. It was analyzed that these damages were attributed to the inherent construction problems of the buildings. The nodal provisions and norms were defined in the rules and regulations under the national vision of the disaster management. However, the disaster demonstrated the compliance of these norms was not implemented at all. It is important to note that the structures which were properly engineered and nonengineered in the epicentre region escaped with only minor damage to them. This clearly demonstrates the importance of a good construction practice for seismic safety of the constructions.
- **There is a lack in updating the information on the available resources and plans.**  
Although Disaster management plans do exist at district and further levels in most of the states, the plans have not been updated with the latest information and statistics. Though most of the districts and states in India have a database of the available resources and plans of disaster management have not been updated after an experience of any disaster. In India, in the present disaster management system, there are a good number of arrangements and schemes to address the natural disasters. There may be a few weaknesses in the system the main strength lies in the paradigm shift from relief to prevention. Following recommendations suggest steps to ensure that the process is implemented appropriately as pictured in the vision of national disaster management policy.
- **Develop Guidelines for Better Coordination Between Stakeholders**  
The past disasters which occurred in India have shown that there are a number of stakeholders who might actually provide support during disasters or emergencies. It is important to develop guidelines and take measures to receive a combined support from the agencies. The guidelines may be framed accordingly depending on the type of organization/agency/stakeholder and the type of support it can provide in peacetime as well as during natural calamities. Based on the standard guidelines that are issued national to state governments, an appropriate cooperation among different stakeholders may be undertaken.
- **Training for technical skills during rescue operations at various levels**  
The key factors in a successful post disaster management are efficient technical skills during a rescue operation, coordination during relief operation and people's participation during rehabilitation program. The expert team after the Gujarat earthquake has reviewed that the

initiative which was people owned was the best option for successful disaster mitigation. However, it was identified that there has been a lack in the number of people with adequate skill set of rescue operations. The state governments may take the initiative of making voluntary organizations, agencies, and institutes who has a good knowledge of how a rescue operation is performed, to involve in the post disaster management program.

- **Integration of Disaster Management into Development/Regional Plans**

Sustainability is one of the main concerns of the National Disaster Management system. The subject of disaster management has to be included in the planning system at all the levels of district, city and region by using the guidelines from state development departments. The national governments may tell the state governments to include the disaster management initiatives in the regional and development plans of town planning departments.

- **Strengthen the First Responder**

The national system for disaster management has taken the initiative to develop skilled personal and separate teams at state and community levels and make provisions for specialized equipment, to develop an efficient communication network and emergency control rooms.

#### **To Do Activity**

On the basis of newspaper clippings, magazines, journals, governmental reports, nongovernmental surveys etc. & to trace and note down the history of disasters in your hometown or the place where you stay, in order to find out the timeline of disasters that have occurred so far.

## **4.2 Disaster Management Act 2005 and National Guidelines and Plans on Disaster Management**

### **Disaster Management Act 2005**

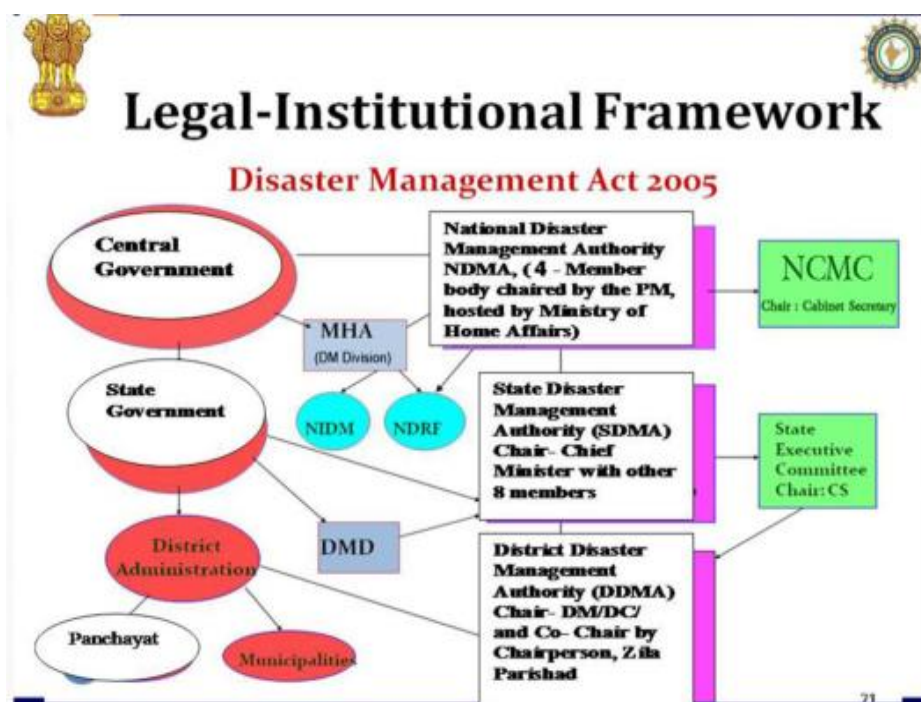
“The Disaster Management Act, 2005 (DM Act 2005) lays down institutional and coordination mechanism for effective Disaster Management (DM) at the national, state, district and local levels. As mandated by this Act, the Government of India created a multitiered institutional system consisting of the National Disaster Management Authority (NDMA) headed by the Prime Minister, the State Disaster Management Authorities (SDMAs) headed by the respective Chief Ministers and the District Disaster Management Authorities (DDMAs) headed by the District Collectors and co-chaired by Chairpersons of the local bodies. These bodies have been set up to facilitate a paradigm shift from the hitherto relief centric approach to a more proactive, holistic and integrated approach of strengthening disaster preparedness, mitigation, and emergency response.”

“The Disaster Management Act, 2005, (23 December 2005) No. 53 of 2005, was passed by the Rajya Sabha, the upper house of the Parliament of India on 28 November, and by the Lok Sabha, the lower house of the Parliament, on 12 December 2005. It received the assent of The President of India on 9 January 2006. The Disaster Management Act, 2005 has 11 chapters and 79 sections. The Act extends to the whole of India. The Act provides for the effective management of disasters and for matters connected there with or incidental thereto.



The Act has a National Disaster Management Authority (NDMA), with the Prime Minister of India as its chairperson. Along with the Vice Chairperson there are not more than nine members in the NDMA. The tenure of the members of the NDMA is five years. The NDMA which was established on 30 May 2005 by an executive order was constituted under Section 3(1) of the Disaster Management Act, on 27 September 2006. The NDMA is responsible authority for setting the policies, plans and guidelines for disaster management and to ensure timely and effective response when a disaster occurs. Under section 6 of the Act the guidelines which are defined by the authority are to be followed by the State Authorities in preparing the State Plans.

The Act under Section 8 instructs the Central Government to constitute a National Executive Committee (NEC) to assist the NDMA. The NEC has Secretary level officers of the Government of India in the Ministries, National Executive Committee of home, agriculture, atomic energy, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, science and technology, space, telecommunication, urban development, and water resources. The Home secretary serves as the Chairperson, ex officio. The Chief of the Integrated Defence Staff is an ex officio member of the NEC. The NEC under section 8 of the Act prepares the National Disaster Management Plan for the whole country and ensures that it is reviewed and updated annually".



“Under Section 14 of the Act, all the State Governments are mandated to establish a State Disaster Management Authority (SDMA). The SDMA consists of the Chief Minister of the State, as the Chairperson, and the Chairperson appoints not more than eight members in the SDMA. State Executive Committee is responsible (Section 22) for preparing the plan for state disaster management and also implementing the National Plan. Under Section 28 the SDMA is mandated to ensure that all the departments of the SDMA to prepare state disaster management plans as prescribed by the National and State Authorities. Collector is the Chairperson of District Disaster Management Authority (DDMA) or District Magistrate or Deputy Commissioner of the district. The elected representative of the area is member of the DDMA as an ex officio cochair person, (Section 25).



The Section 44–45 of the Act provides a National Disaster Response Force "for the purpose of giving a specialist response to a major disastrous situation or a natural disaster" under a Director General who is appointed by the Central Government. In Kashmir floods which occurred in September 2014, NDRF played an important role in rescue operations of the armed forces and tourists, for which government of India awarded NDRF. Other Provisions are Section 42 of the Act is responsible for establishing a National Institute of Disaster Management. Section 4650 directs funds for Disaster Mitigation at various levels. The Act provides for civil and criminal liabilities for those who violate the provision of the Act."

### **National Guidelines and Plans on Disaster Management**

"The National Disaster Management Plan (NDMP) provides the guidelines in designing the framework and directs all the government agencies in all the phases of disaster management cycle. The NDMP is a dynamic document which is periodically updated with the best global practices and knowledge base in disaster management. It is prepared in accordance with the provisions of the Disaster Management Act, 2005, the guidelines given in the National Policy on Disaster Management, 2009 (NPDM), and the established national practices.

The NDMP identifies where there is a need to minimize without completely eliminating if there is any ambiguity in the responsibility framework. It defines who is responsible for what in the different stages of disaster management. The NDMP is envisaged as active and ready at all times in response to an emergency situation in any part of the country. It is designed in a flexible and scalable manner so that it can be implemented as needed in all the phases of managing a disaster. The different phases are a) mitigation phase(prevention and risk reduction), b) preparedness phase, c) response phase and d) recovery phase (immediate restoration to build back better).

The NDMP steadily follows the approaches which are promoted globally by the United Nations, in particularly the Sendai Framework which was developed for Disaster Risk Reduction 20152030. It is a nonbinding agreement, which the signatory nations will attempt to comply with on a voluntary basis. By following the Sendai Framework recommendations and by adopting best practices which are accepted globally, India is making all efforts to improve the disaster management cycle in India and to contribute to the realization of the global targets.

The four priorities for action under the Sendai Framework are

1. Understanding the risk from a disaster
2. Firming up of the disaster risk governance to manage the risk
3. Spending in disaster risk reduction processes for resilience
4. Improving disaster preparedness so that there will be effective response and to have "Build Back Better" in recovery, rehabilitation and reconstruction phases.

The NDMP includes the basic approach which is articulated in the Sendai Framework and help the country to meet its goals that are set in the framework. The aim of the Sendai Framework is to achieve substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries by 2030. The goals and priorities which are set out in the Sendai Framework for DRR, are aligned largely in the NDMP. The four crosscutting Sendai priorities are present explicitly or implicitly in every aspect of this plan and certain chapters have specific priorities as per the dominant theme. The plan

also incorporates measures that will be implemented over the short, medium, and long term more or less according to the time horizon of the Sendai Framework ending in 2030. The measures which are mentioned here are indicative ones and not exhaustive ones. The plan will incorporate changes based on the national experiences and global practices during the periodic reviews and updates. The four priorities which are enunciated in the Sendai Framework are included in the approach used in the national plan for each hazard under the five Thematic Areas for Action

1. Understanding of the risk
2. Coordination between Inter-Agencies
3. Spending money in developing DRR – Structural Measures
4. Spending money in DRR – Non-Structural Measures
5. Developing capacity

The NDMP has put forward a set of major themes for each thematic area of action to responsibly conduct activities as per the broad planning framework.”

### **Institutional Arrangements**

Since Independence, the institutional and policy mechanisms have been well established in order to efficiently conduct the response, relief and rehabilitation programs and these programs have proved to be very strong and efficient in performing the response, relief and rehabilitation operations.

In the national government, the Ministry of Home Affairs is the nodal ministry for all matters related to the disaster management. The Central Relief Commissioner (CRC) of the Ministry of Home Affairs is the nodal officer to coordinate the relief operations of natural calamities. India Meteorological Department (IMD) or the Central Water Commission of Ministry of Water Resources sends information to the CRC, related to forecasting/warning of a natural calamity, on a continuous basis. The Ministries/Departments/Organizations which are concerned with the primary and secondary functions of the disaster management include India Meteorological Department, Central Water Commission, Ministry of Home Affairs, Ministry of Defence, Ministry of Finance, Ministry of Rural Development, Ministry of Urban Development, Department of Communications, Ministry of Health, Ministry of Water Resources, Ministry of Petroleum, Department of Agriculture & Cooperation, Ministry of Power, Department of Civil Supplies, Ministry of Railways, Ministry of Information and Broadcasting, Planning Commission, Cabinet Secretariat, Department of Surface Transport, Ministry of Social Justice, Department of Women and Child Development, Ministry of Environment and Forest, Department of Food. Each Ministry/Department/Organization nominate their nodal officer to the Crisis Management Group chaired by Central Relief Commissioner. The nodal officer who is appointed, is responsible for preparing sectoral Action Plan/Emergency Support Function Plan of the disaster management.

**National Crisis Management Committee (NCMC)** Cabinet Secretary, who is the highest executive officer, heads the NCMC. The members of the NCMC are the Secretaries of all the concerned Ministries /Departments as well as organizations. The NCMC guides the Crisis Management Group as required. The Secretary, Ministry of Home Affairs is responsible to ensure that all developments are brought to the notice of the NCMC promptly. The NCMC has the authority to give directions to any Ministry/Department/Organization in taking the specific action as needed by the crisis situation.

**Crisis Management Group** The Central Relief Commissioner in the Ministry of Home Affairs is the Chairman of the CMG. It consists of senior officers (called nodal officers) from various concerned Ministries. The CMG's reviews the contingency plans of every year which are formulated by various Ministries/Departments/Organizations in their respective sectors, it takes measures required in dealing a natural calamity, it coordinates the activities of the Central Ministries and the State Governments in the activities of disaster preparedness and relief and also to get information from the nodal officers on measures relating to above. The CMG, whenever a natural disaster occurs, meets frequently to review the rescue and relief operations and extend all the support to the affected States to overcome the disaster situation effectively. The Resident Commissioner of the affected State is also associated with such meetings.

**Control Room (Emergency Operation Room)** An Emergency Operations Centre (Control Room) exists in the nodal Ministry of Home Affairs, which functions round the clock, to assist the Central Relief Commissioner in the discharge of his duties. The activities of the Control Room include collection and transmission of information concerning natural calamity and relief, keeping close contact with governments of the affected States, interaction with other Central Ministries/Departments/Organizations in connection with relief, maintaining records containing all relevant information relating to action points and contact points in Central Ministries etc., keeping up-to-date details of all concerned officers at the Central and State levels.

**Contingency Action Plan** A National Contingency Action Plan (CAP) for dealing with contingencies arising in the wake of natural disasters has been formulated by the Government of India and it had been periodically updated. It facilitates the launching of relief operations without delay. The CAP identifies the initiatives required to be taken by various Central Ministries/Departments in the wake of natural calamities, sets down the procedure and determines the focal points in the administrative machinery.

**State Relief Manuals** Each State Government has relief manuals/codes which identify that role of each officer in the State for managing the natural disasters. These are reviewed and updated periodically based on the experience of managing the disasters and the need of the State.

**Funding Mechanisms** The policy and the funding mechanism for provision of relief assistance to those affected by natural calamities is clearly laid down. These are reviewed by the Finance Commission appointed by the Government of India every five years. The Finance Commission makes recommendation regarding the division of tax and nontax revenues between the Central and the State Governments and also regarding policy for provision of relief assistance and their share of expenditure thereon.

As per the recommendations of the Eleventh Finance Commission a Calamity Relief Fund (CRF) has been set up in each State. The Finance Commission fixes the size of this Calamity Relief Fund, after considering and evaluating the costs spend on relief and rehabilitation programs over the past 10 years. The Government of India spends approximately 75% of the corpus amount of the Calamity Relief Fund in each State. State Government contributes 25%. CRF grants the relief assistance to those affected who are affected by natural calamities. All the rules for relief assistance are laid down by a national committee with the representatives of States as its members. Different State Governments have their own State specific norms as recommended by the State level committee under the direction

of the Chief Secretary. The State Government seeks assistance from the National Calamity Contingency Fund (NCCF) a fund which is created at the Central Government level, when a calamity occurs of huge proportion that the which are available in the CRF are not sufficient for conducting the relief operations.

A team from the Central Government assesses the requirements, whenever such requests are received and these assessed requirements are cleared by a High Level Committee to which Deputy Prime Minister is the Chairperson. In brief, the arrangements made for response and relief activities by these institutions are well established and have proved to be strong and effective.

#### **To Do Activity**

Prepare a list of contacts (names, addresses and role) of as many disaster management agencies as you can in your neighbourhood / village / city.

### **4.3 Role of Government, Non Government and Inter Governmental Agencies in National Disaster Management**

#### **Role of the Union Government**

“In spite of the fact that the State Government concerned has the essential duty regarding emergency the board, the Union Government assumes a key steady job as far as physical and money related assets and giving reciprocal measures, for example, early cautioning and coordination of endeavours of every association service, divisions and associations. At the pinnacle level, a Cabinet Committee on Natural Calamities surveys the emergency circumstance.

An abnormal state board of trustees of clergymen under the chairmanship of Minister of Agriculture manages the issue of monetary help to be given to the State Governments from the National Disaster Response Fund, if the assets accessible with the State Governments under State Disaster Response Fund are not satisfactory. Matters identifying with atomic, natural and concoction crises are cared for by the Cabinet Committee on Security.

#### **National Crisis Management Committee**

The Cabinet Secretary, as the most elevated official, heads the National Crisis Management Committee (NCMC). Secretaries of services and divisions concerned and heads of different associations are individuals from NCMC, which surveys and screens emergency circumstances all the time and offers bearings to the Crisis Management Group, as considered important. The NCMC can offer headings to any service, division or association for explicit activity required for gathering the emergency circumstance. As debacle the executives is a multidisciplinary procedure, every single Central Ministry and Departments have a key job in the field of calamity the board. In perspective on the profoundly specialized and explicit nature of certain fiasco occasions, for example, flying fiascos, rail mishaps, substance catastrophes and organic debacles and so on.; the services managing that specific subject have the nodal duty regarding taking care of that specific kind of calamity.

#### **Nodal Ministries/Department for Disaster Management at the National Level**

1. Droughts – Ministry of agriculture.
2. Epidemics and Biological Disasters – Ministry of Health.

3. Chemical or Industrial Chemical Disasters – Ministry of Environment & Forest.
4. Nuclear Accidents – Department of Atomic Energy.
5. Railway Accidents – Ministry of Railways.
6. Air Accidents – Ministry of Civil Aviation.
7. Natural Disasters except Drought & Epidemics and Civil Strife – Ministry of Home Affairs.

The Secretaries of the Nodal Ministries and Departments of GOI, i.e. the Ministry of Home Affairs (MHA), Agriculture, Civil Aviation, Environment and Forests, Health, Atomic Energy, Space, Earth Sciences, Water Resources, Mines, Railways etc. are all members of the NEC and function as nodal agencies for specific disasters based on their core competencies or as assigned to them. The coordination between various nodal ministries/departments is done by National Executive Committee (NEC), which is headed by Home Secretary.

### **Role of State Government**

In India, the essential obligation to attempt salvage, help and recovery measures in case of catastrophic events rests with the state government. Since the earliest reference point, the whole structure of emergency organization in the state governments had been arranged towards post calamity help and restoration.

A large portion of the states have Relief Commissioners who are accountable for the help and recovery measures. A large portion of the states have exchanged over to a Disaster Management Department with the required linkages with the different advancement and administrative divisions worried about counteractive action, moderation and readiness.

Each state has a Crisis Management Committee under the chairpersonship of the Chief Secretary, comprising of secretaries accountable for concerned offices, which audits emergency circumstances on an everyday premise at the season of emergency, facilitates the exercises all things considered and gives choice emotionally supportive network to the area organization. At the priests' level, a Cabinet Committee on Natural Calamities under the chairpersonship of the Chief Minister checks out circumstances and is in charge of exceedingly significant arrangement choices.

### **Role of District Administration**

The District Magistrate/Collector has the duty regarding in general administration of catastrophes in the locale. He has the expert to activate the reaction hardware and has been given monetary forces to draw cash under the arrangements of the General Financial Rules/Treasury Codes. All branches of the State Government, including the police, fire administrations, open works, water system and so forth., work in an organized way under the authority of the Collector during a fiasco, with the exception of in metropolitan regions where the civil body assumes a noteworthy job. The District Collector likewise appreciates the specialist to demand for help from the Armed Forces if conditions so request. NGOs have additionally been compelling in giving alleviation, salvage and restoration as of late.

### **Role of Local Self Governments**

Nearby self governments, both rustic and urban, have developed as significant levels of administration, after the 73rd and 74th Amendments to the Constitution. For the general population, they are likewise the closest units of organization and are among the people on call for any emergency

other than being intently sew with the networks. These units would thus be able to assume a significant job in emergency the executives under the general initiative of the District Administration."

### **Nongovernment and Intergovernmental Agencies**

"NGO exercises structure a significant piece of global advancement and help work. There are various NGOs like the Red Cross Society, which have explicit territories of field activities, and a broad system to broaden material, budgetary, just as specialized help. There are beneficent trusts for undertaking the dissemination work following the catastrophe. These associations consistently approached to assume a significant job to help the administration in formative exercises in various pieces of the nation. The High Powered Committee (HPC) 2001 has suggested an across the nation system of NGOs for facilitated activity incorporating all parts of fiasco the board.

The Disaster Management Act 2005 stresses the requirement for persistent and incorporated procedure of arranging, sorting out, organizing and executing strategies and plans on DM in a comprehensive, network based, and participatory, comprehensive and practical way. The Act endows/orders the State Executive Committees at various levels with the duty to exhort, help and arrange the exercises of NGOs occupied with catastrophe the board.

The job of the philanthropic organizations and NGOs is to enhance the endeavours of the administration along these lines helping networks to adapt and recuperate from the catastrophe. The NGOs inside their very own abilities and orders play out these jobs (as indicated in various segments of these Guidelines) in accordance with the fundamental standards of the Humanitarian Charter, The Red Cross and Red Crescent NGO Code of Conduct, and the laws and guidelines, as relevant.

Some inter governmental agencies like the Housing Boards, working in the field of rehabilitation and reconstruction of the disaster affected areas. Some of these agencies are

**State Housing Corporation** Its role is related to disaster resistant housing construction.

**Building Materials and Technology Promotion Council (BMTPC)** Its role pertains to propagating lowcost building materials and alternative construction techniques for disaster resistant construction.

**Central Building Research Institute** It works in the area of research on the habitat aspects for disasterprone areas.

**Housing and Urban Development Corporation (HUDCO)** It works in financing and executing postdisaster rehabilitation work along with conceiving methods for disaster preparedness and disaster resistant housing.

**Structural Engineering Research Institute** It works in the areas of postdisaster surveys, damage analysis, vulnerability and risk analysis of buildings and structures against natural disasters."

### To Do Activity

- 1) Contact any NGO working in the area of disaster management in your local area and enquire about its activities.
- 2) Find out in your area about community based disaster preparedness programme. Write a note about it and suggest ways of involving, the community in a more effective way in disaster preparedness.

#### 4.4 National Disaster Management Authority (NDMA) and National Institute of Disaster Management (NIDM)

"The Government of India (GOI), in acknowledgment of the significance of Disaster Management as a national need, has set up a High Powered Committee (HPC) in August 1999 and furthermore a country council after the Gujarat tremor, for making proposals on the arrangement of Disaster Management plans and recommendation compelling moderation components. The Tenth FiveYear Plan Document likewise had, just because, a point by point part on Disaster Management. Likewise, the Twelfth Finance Commission was additionally commanded to audit the monetary game plans for Disaster Management. On 23 December 2005, the Government of India authorized the Disaster Management Act, which imagined the production of the National Disaster Management Authority (NDMA), headed by the Prime Minister, and State Disaster Management Authorities (SDMAs) headed by particular Chief Ministers, to initiate and execute an all-encompassing and coordinated way to deal with Disaster Management in India.



#### NDMA Vision

"To build a safer and disaster resilient India by a holistic, proactive, technology driven and sustainable development strategy that involves all stakeholders and fosters a culture of prevention, preparedness and mitigation."

#### Organisation Structure

The National Disaster Management Authority has been established under the Disaster Management Act 2005, with the Prime Minister of India as its Chairman; a Vice Chairman with the status of Cabinet Minister, and eight individuals with the status of Ministers of State. With well-characterized useful spaces for every one of its individuals and worry to complete the ordered capacities, NDMA has advanced into a lean and expert association which is IT empowered and information based. Aptitudes and skill of the pros are widely used to address fiasco related issues. A practical and operational



framework has been manufactured, which is suitable for debacle the executives including vulnerabilities combined with wanted strategies.

Thoughtfully the association depends on a 'calamity divisions cu secretariat' framework. Every individual from the Authority heads fiasco explicit divisions for explicit debacle and useful spaces. Every part has likewise been given the obligation of indicated states and UTs for close connection and coordination. The NDMA Secretariat, headed by a Secretary, is in charge of giving secretarial help and progression. The Secretariat manages alleviation, readiness, plans, recreation, network mindfulness and money related and regulatory viewpoints. NDMA likewise has the National Disaster Management Operations Centre which will be outfitted with a best in class flexible and repetitive correspondence frameworks, NDMA additionally does the errands of limit advancement, preparing and information the executives.

### **Functions and Responsibilities**

NDMA, as the apex body, is mandated to lay down the policies, plans and guidelines for Disaster Management to ensure timely and effective response to disasters. Towards this, it has the following.

#### **Responsibilities**

- Lay down strategies on calamity the executives.
- Approve the National Plan.
- Approve plans arranged by the Ministries or Departments of the Government of India as per the National Plan.
- Lay down rules to be trailed by the State Authorities in illustration up the State Plan.
- Lay down rules to be trailed by the various Ministries or Departments of the Government of India to coordinate the measures for aversion of debacle or the alleviation of its belongings in their advancement plans and activities.
- Coordinate the authorization and execution of the strategy and plans for catastrophe the executives.
- Recommend arrangement of assets with the end goal of relief.
- Provide such help to different nations influenced by serious catastrophes as might be dictated by the Central Government.
- Take such different measures for the aversion of fiasco, or the relief, or readiness and limit working for managing Threatening debacle circumstances or catastrophes as it might think about important.
- Lay down wide strategies and rules for the working of the National Institute of Disaster Management.

#### **NDMA Policy**

The National Policy system has been set up after due thought and keeping in view the National Vision to construct a safe and calamity strong India by building up an all encompassing, proactive, multi catastrophe and innovation driven technique for DM. This will be accomplished through a culture of anticipation, alleviation and readiness to produce a brief and effective reaction during debacles. The whole procedure will be the focal point of the audience the network and will be given energy and sustenance through the aggregate endeavours of all administration offices and Non-Governmental

Organizations'. So as to make an interpretation of this vision into arrangement and plans, the NDMA has embraced a mission mode approach including various activities with the assistance of different establishments working at the national, state and nearby levels. Focal services, States and different partners have been engaged with the participatory and consultative procedure of developing strategies and rules. This Policy structure is additionally in congruity with the International Strategy for Disaster Reduction, the Rio Declaration, the Millennium Development Goals and the Hyogo Framework 2005-2015. The themes that underpin this policy are

- Community based disaster management, including last mile integration of the policy, plans and execution.
- Capacity development in all related areas.
- Consolidation of past initiatives and best practices.
- Cooperation with agencies at the national, regional and international levels.
- Compliance and coordination to generate a multisectoral synergy.”

#### **NIDM (National Institute of Disaster Management)**

“Under Section 42 of the Disaster Management Act, 2005, NIDM was established to be the head organization for limit building, preparing and advancement for calamity the executives in India. The establishment has faith in a "Culture of Prevention" standpoint towards catastrophe hazard decrease. Through a key, multiparter and multidisciplinary methodology, the foundation creates preparing modules, arranges preparing programs, embraces research and documentation and advances courses, addresses and meetings on calamity the executives and hazard decrease.

According to the arrangements of the Chapter VII of the DM Act, Government of India established the National Institute of Disaster Management (NIDM) under an Act of Parliament with the objective of being the head foundation for limit advancement for calamity the board in India and the area. The vision of NIDM is to make a Disaster Resilient India by structure the limit at all levels for calamity counteractive action and readiness. NIDM has been doled out nodal obligations regarding human asset improvement, limit building, preparing, research, documentation, and arrangement backing in the field of debacle the executives. The NIDM has manufactured key associations with different services and branches of the focal, state, and neighbourhood governments, scholarly, research and specialized associations in India and abroad and other bihorizontal and multiparallel worldwide offices. It gives specialized help to the state governments through the Disaster Management Centers (DMCs) in the Administrative Training Institutes (ATIs) of the States and Union Territories. Directly it is supporting upwards of 30 such focuses. Six of them are being created as Centers of Excellence in the specific territories of hazard the executives – flood, quake, violent wind, dry spell, avalanches, and mechanical debacles.”

#### **4.5 State Disaster Management Authorities and National Disaster Response Force**

##### **State Disaster Management Authorities**

“In the administrative set up of India, the fundamental duty regarding undertaking salvage, help and recovery measures in case of a catastrophe is that of the State Government concerned. At the State level, reaction, alleviation and recovery are taken care of by Departments of Relief and Rehabilitation. The State Crisis Management Committee set up under the Chairmanship of Chief Secretary who is the most noteworthy official functionary in the State. All the concerned Departments and associations of the State and Central Government Departments situated in the State are spoken to in this Committee.

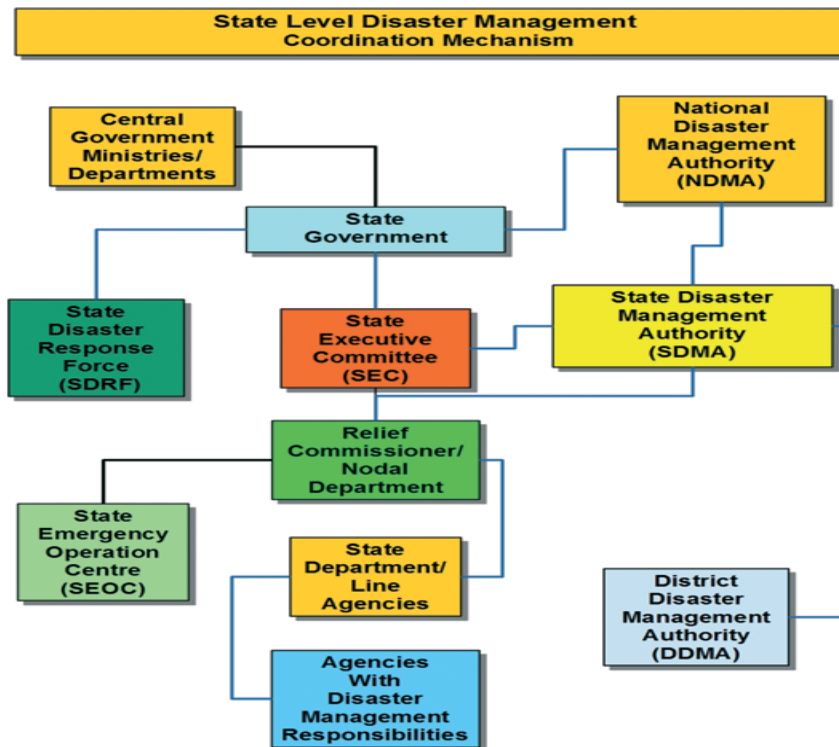
This Committee audits the move made for reaction and alleviation and gives rules/bearings as vital. A control room is set up under the Relief Commissioner. The control room is in steady touch with the atmosphere observing/determining organizations and screens the move being made by different offices in playing out their duties.

According to the DM Act of 2005, each state in India will have its own institutional structure for fiasco the executives. In addition to other things, the DM Act, commands that each State Government will make vital strides for the arrangement of state DM plans, mix of measures for avoidance of calamities or alleviation into state improvement plans, distribution of assets, and build up EWS. Contingent upon explicit circumstances and requirements, the State Government will likewise help the Central Government and focal organizations in different parts of DM. Each state will set up its very own State Disaster Management Plan.

The DM Act orders the setting of a State Disaster Management Authority with the Chief Minister as the ex officio Chairperson. Comparative framework will work in every Union Territory with Lieutenant Governor as the Chairperson. At the region level, District Disaster Management Authority (DDMA), the District Collector or District Magistrate or the Deputy Commissioner, as appropriate, will be in charge of by and large coordination of the fiasco the executives endeavors and arranging. Nitty gritty DMP will be created, subject to occasional audit and correction, at the degrees of state, locale, towns and Chapters (taluka)."Figure4.1 provides schematic view of the typical statelevel institutional framework.

#### **State Disaster Management Authority (SDMA)**

"According to arrangements in ChapterIII of the DM Act, each State Government will set up a State Disaster Management Authority (SDMA) or its proportionate under an alternate name with the Chief Minister as the Chairperson. In the event of different UTs, the Lieutenant Governor or the Administrator will be the Chairperson of that Authority. For the UT of Delhi, the Lieutenant Governor and the Chief Minister will be the Chairperson and ViceChairperson individually of the State Authority. On account of an UT having Legislative Assembly, with the exception of the UT of Delhi, the Chief Minister will be the Chairperson of the Authority set up under this area. The SDMA will set down approaches and plans for DM in the State. It will, entomb alia affirm the State Plan as per the rules set somewhere near the NDMA, organize the usage of the State Plan, suggest arrangement of assets for moderation and readiness measures and survey the formative plans of the various Departments of the State to guarantee the incorporation of counteractive action, readiness and relief measures. The State Government will comprise a State Executive Committee (SEC) to help the SDMA in the exhibition of its capacities. The SEC will be going by the Chief Secretary to the State Government. The SEC will arrange and screen the usage of the National Policy, the National Plan, and the State Plan. The SEC will likewise give data to the NDMA identifying with various parts of DM."



**Figure 4.4 State Level Disaster Management**

### National Disaster Response Force

The National Disaster Response Force (NDRF) is a particular power comprised "with the end goal of expert reaction to an undermining calamity circumstance or fiasco under the Disaster Management Act, 2005. The Apex Body for Disaster Management in India is the National Disaster Management Authority (NDMA). The Chairman of the NDMA is the Prime Minister.

It is shaped in 2006 under the ward of Disaster Management Act, 2005. Its home office is in New Delhi. National Disaster Response Force (NDRF) is under the National Disaster Management Authority. The NDRF has been comprised according to the Chapter VIII of the DM Act 2005 as an expert reaction power that can be conveyed in an undermining debacle circumstance or calamity. According to the DM Act, the general superintendence, bearing and control of the NDRF will be vested and practiced by the NDMA. The order and supervision of the NDRF will vest with the Director General designated by the Government of India. The NDRF will position its contingents at various areas as required for powerful reaction. NDRF units will keep up close contact with the assigned State Governments and will be accessible to them in case of any genuine compromising calamity circumstance. The NDRF is prepared and prepared to react to circumstances emerging out of catastrophic events and CBRN crises. The NDRF units will likewise bestow fundamental preparing to every one of the partners recognized by the State Governments in their individual areas. Further, a National Academy will be set up to give preparing to mentors in a fiasco the executives and to meet related National and International responsibilities. Involvement in serious catastrophes has plainly demonstrated the requirement for pre-situating of some reaction powers to enlarge the assets at the State level at urgent areas incorporating some in high height districts."



**Figure 4.5 NDRF Forces Serving during Gujarat Earthquake**

### **Composition**

"National Disaster Response Force (NDRF) is a power of 12 units, composed on paramilitary lines, and kept an eye on by people on nomination from the paramilitary powers of India three Border Security Force, three Central Reserve Police Force, two Central Industrial Security Force, two IndoTibetan Border Police and two Sashastra Seema Bal. The all out quality of every legion is roughly 1149. Every legion is equipped for giving 18 independent authority search and salvage groups of 45 staff each including specialists, professionals, circuit repairmen, hound squads and therapeutic/paramedics. NDRF notwithstanding having the option to react to cataclysmic events has four brigades equipped for reacting to radiological, atomic, natural and concoction debacles.

### **Deployment**

These NDRF legions are situated at twelve distinct areas in the nation dependent on the powerlessness profile to chop down the reaction time for their sending. During the readiness time frame/in a compromising fiasco circumstance, proactive sending of these powers will be done by the NDMA in interview with state specialists.

### **Functional Parameters**

The point of the National Disaster Management Authority is to assemble a more secure and fiasco resilient India by building up an allen compassing, proactive, multi-calamity and innovation driven system for debacle the executives. This must be accomplished through a culture of counteractive action, relief and readiness to produce a brief and proficient reaction at the season of debacles. These national visions bury alia, goes for teaching a culture of readiness among all partners. NDRF has demonstrated its significance in accomplishing this vision by exceedingly gifted salvage and help tasks, ordinary and escalated preparing and reparing, acquaintance practices inside the territory of obligation of separate NDRF Bns, doing taunt penetrates and joint activities with the different partners.



## **Disaster Response**

NDRF has demonstrated its adequacy with its excellent presentation during different calamities including the suffocating cases, building breakdown, avalanches, annihilating floods and Cyclones. NDRF has spared 1,33,192 human lives and recovered 276 dead assortments of calamity unfortunate casualties in 73 reaction tasks in the nation.”

## **Challenges for the Future**

“There is a developing need to take a gander at debacles from an improvement point of view. Catastrophes can have wrecking impact on networks and can essentially interfere with improvement endeavors as it were. In any case, at that point, it could likewise offer a chance to put resources into advancement endeavors in a post debacle situation. Fiascos are open doors for networks to rehash themselves. Calamity counteractive action, moderation, readiness and help are four components, which add to and gain from the usage of practical improvement arrangements. These components, alongside ecological insurance and economical advancement, are intently between related. The Yokohama Strategy, radiating from the worldwide decade for cataclysmic event decrease in May 1994, underlines that calamity counteractive action, relief and readiness are superior to debacle reaction in accomplishing the objectives and goals of weakness decrease.

The Government of India has received relief and anticipation as basic parts of its advancement technique. The Tenth Five Year Plan accentuates the way that improvement can't be supportable without relief being incorporated with the advancement procedure. In a nutshell, Disaster Management is being regulated into improvement arranging. Be that as it may, there are different hidden issues in the entire procedure. Actually, various issues originate from social imbalances. Over the long haul, the onus is upon the nearby networks to deal with catastrophes with the assistance of the state and other such associations. The people group elements are very unpredictable in a nation like India. There is a need to address explicit nearby needs of helpless networks through neighborhood conventions and societies. Reclamation of regular property assets with the cooperation of the neighbourhood level bodies is a genuine test. The verifiable focal point of debacle the executives has been on alleviation and recovery after the occasion yet now the emphasis is on making arrangements for catastrophe readiness and relief. Given the high recurrence with which one or other piece of the nation endures because of fiascos, relieving the effect of debacles must be a vital part of our advancement arranging.

One of the glaring lacunae during the time spent Disaster Management in India has been the ignoring of unnatural calamities. The ongoing endeavours centre absolutely around cataclysmic events, though the current worldwide circumstance additionally requests activities in dealing with the effect of unnatural debacles. Advancements at the universal level, especially the common wars and common struggle in Eastern Europe and Southern America coming full circle on 9/11 have brought the issue of unnatural fiascos at the cutting edge of catastrophe the board. The worldwide network has perceived the genuine outcomes of Nuclear, Biological and Chemical (NBC) fighting. The remaining part is a genuine test for India to address sooner rather than later.

The need of great importance is to chalk out a multipronged methodology for all out catastrophe the executives involving counteractive action, readiness, reaction and recuperation from one viewpoint and start improvement endeavours pointed towards hazard decrease and moderation on the other. The nations in the Asia Pacific district ought to set up a local co-appointment component for space

innovation based catastrophe alleviation and fortify co-task, Luan recommended, adding that they additionally need to set up an all climate and unequalled exhaustive space based debacle relief framework and offer the data. A professional dynamic position to decrease the toll of calamities in the nation requires a progressively far reaching approach that includes both pre-catastrophe hazard decrease and post debacle recuperation. It is confined by new approaches and institutional courses of action that help successful activity. Such a methodology ought to include the accompanying arrangement of exercises

- Risk examination to recognize the sorts of dangers looked by individuals and advancement speculations just as their extent.
- Prevention and alleviation to address the basic wellsprings of helplessness.
- Risk move to spread money related dangers after some time and among various onscreen characters.
- Emergency readiness and reaction to improve a nation's status to adapt rapidly and adequately with a crisis.
- Post-catastrophe restoration and recreation to help successful recuperation and to shield against future debacles."

#### **To Do Activity**

Identify a major disaster in India like the Indian Ocean Tsunami in 2004 or Gujarat earthquake, 2001 or Kashmir floods, 2014 or any other major disaster and highlight how India has faced the disaster with its existing mechanisms and policy framework for disaster management.

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# Chapter 5 International Framework

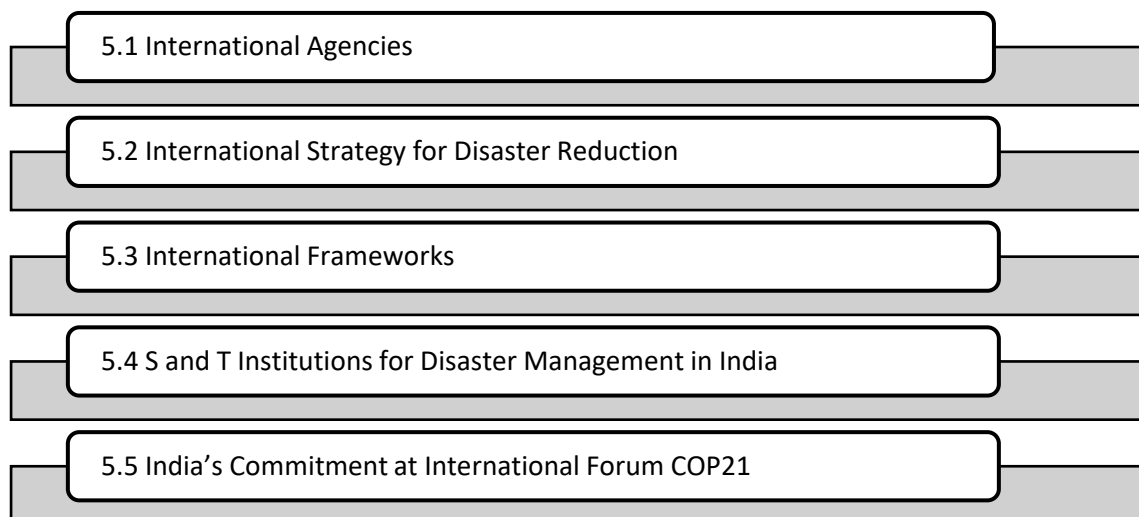
## Introduction

This chapter is dedicated to the concept of International disaster management. More specifically, this chapter will provide an overview of disaster management and its framework in internationally. This chapter deals with the International disaster agencies and also explains the International Strategy for Disaster Reduction on disaster management. The Hyogo Framework (20052015); Sendai Framework and India's commitment at International Fora COP21 is clearly discussed.

## Objectives

- To discuss the concept of International disaster management.
- To explain the International disaster agencies and the International Strategy for Disaster Reduction on disaster management.
- To understand the Hyogo Framework (20052015); Sendai Framework and India's commitment at International Fora COP21.

## Structure



## 5.1 International Agencies

### The United Nations Office for Disaster Risk Reduction (UNISDR)

UNISDR was created in December 1999. The successor to the secretariat of the International Decade for Natural Disaster Reduction, it was established to ensure the implementation of the International Strategy for Disaster Reduction. UNISDR was formed in 1999 with its Headquarters in Geneva, Switzerland. The Parent organization of UNISDR is United Nations Secretariat. UNISDR is part of the United Nations Secretariat and its functions span the social, economic, environmental as well as humanitarian fields. UNISDR supports the implementation, follow up and review of the Sendai Framework for Disaster Risk Reduction adopted by the Third UN World Conference on Disaster Risk Reduction on 18 March 2015 in Sendai, Japan. The Sendai Framework is a 15year voluntary, nonbinding agreement that maps out a broad, people centred approach to disaster risk reduction, succeeding the 20052015 Hyogo Framework for Action. UNISDR's vision is anchored on the four priorities for action set out in the Sendai Framework understanding disaster risk, strengthening

disaster risk governance to manage disaster risk, investing in disaster risk reduction for resilience, and enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

UNISDR is led by a United Nations Special Representative of the Secretary General for Disaster Risk Reduction (SRSG) and has over 100 staff located in its headquarters in Geneva, Switzerland, 5 regional offices (Africa Nairobi, the Americas Panama City, Arab States Cairo, Asia Pacific Bangkok and Europe Brussels) and other field presences in Addis Ababa, Almaty, Bonn, Incheon, Kobe, New York UN Headquarters, Rio de Janeiro and Suva. UNISDR coordinates international efforts in Disaster Risk Reduction (DRR) and guide, monitor as well as report regularly on the progress of the implementation of the Sendai Framework for Disaster Risk Reduction, following the Hyogo Framework for Action. It convenes the biennial Global Platform on Disaster Risk Reduction with leaders and decision makers to advance risk reduction policies and supports the establishment of regional, national and thematic platforms. UNISDR informs and connects people by providing practical services and tools such as the risk reduction website Prevention Web, terminology, publications on good practices, country profiles and the Global Assessment Report on Disaster Risk Reduction which is an authoritative biennial analysis of global disaster risks and trends.

**1994 First World Conference on Disaster Reduction and the Yokohama Strategy for a Safer World**  
The Yokohama Strategy for a Safer World Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action was adopted at the World Conference on Natural Disaster Reduction, building on the midterm review of the International Decade for Natural Disaster Reduction.

#### **2007 First Session of the Global Platform on Disaster Reduction**

The UN General Assembly established a biennial Global Platform on disaster risk reduction to support the implementation of the Hyogo Framework for Action, allowing government representatives, NGOs, scientists, practitioners, private sector, IFIs and UN organizations to share experiences, identify remaining gaps, formulate strategic guidance and advice for the implementation of the HFA. Six Regional Platforms and over 80 National Platforms have also been established as multi stakeholder forums.<sup>5</sup> Regional Platforms also assess progress but focus on the details of the regional plans of implementation and National Platforms act as the national coordinating body for disaster risk reduction.

#### **2011 Programme of Action for the Least Developed Countries for the Decade 2011-2020**

The Istanbul Programme of Action (IPoA) charts out the international community’s vision and strategy for the sustainable development of LDCs for the next decade with a strong focus on developing their productive capacities. The Programme recognized that the scale and impact of natural disasters has increased over recent decades, threatening hard won development gains of LDCs. It encourages LDCs to take action in implementing and integrating disaster risk reduction in their national and long term planning and policies.

#### **2012 United Nations Conference on Sustainable Development Rio+20**

The outcome Document The Future We Want – of the United Nations Conference on Sustainable Development – Rio 20+ held in Rio de Janeiro, Brazil on 20–22 June 2012 contains a section (Chapter VA) on disaster risk reduction that sets a firm foundation for discussions on a post2015 framework to continue guiding nations after the Hyogo Framework expires in 2015.

### **Global Assessment Report**

The Global Assessment Report on Disaster Risk Reduction (GAR) is the United Nation's biennial global review and analysis of the natural hazards that are affecting humanity. The GAR monitors risk patterns and trends and progress in disaster risk reduction while providing strategic policy guidance to countries and the international community. The Report is produced in collaboration and consultation with a wide range of stakeholders, including various UN agencies, governments, academic and research institutions, donors and technical organizations and specialists. The Global Assessment Report 2015 is titled 'Making Development Sustainable The Future of Disaster Risk Management' and reviews the disaster risk governance under the HFA and assess to what extent the expected outcome of the HFA has been achieved. The report can be accessed here [Global Assessment Report 2015](#).

### **International Space Charter**

The International Charter "Space and Major Disasters" is a nonbinding charter which provides for the charitable and humanitarian retasked acquisition of and transmission of space satellite data to relief organizations in the event of major disasters. Initiated by the European Space Agency and the French space agency CNES after the UNISPACE III conference held in Vienna, Austria in July 1999, it officially came into operation on November 1, 2000 after the Canadian Space Agency signed onto the charter on October 20, 2000. Their space assets were then, respectively, ERS and ENVISAT, SPOT and Formosat, and RADARSAT.

The assorted satellite assets of various corporate, national, and international space agencies and entities provide for humanitarian coverage which is wide albeit contingent. First activated for floods in northeast France in December 2001, the Charter has since brought space assets into play for numerous floods, earthquakes, oil spills, forest fires, tsunamis, major snowfalls, volcanic eruptions, hurricanes and landslides, and furthermore (and unusually) for the search for Malaysia Airlines Flight 370 and for the 2014 West Africa Ebola outbreak. As of August 2018, it had had 579 activations, from 125 countries, and had 17 members, which contributed 34 satellites. It won the prestigious Pecora award in 2017. Furthermore, specific agreements with other entities, including corporations, allow the Charter access to additional products of high and very high resolution from satellites such as the Formosat series, Geo Eye, IKONOS, Quick Bird, and Worldview. In 2014 the charter was activated 41 times for disasters in 30 countries. The charter was activated for the 2004 Indian Ocean earthquake and tsunami by the Indian Space Research Organisation (ISRO).

### **Other International Agencies**

There are different international agencies like the United Nations (UN) that are participating in the assistance work related to reduction of natural disasters. The predisaster and post disaster recovery process, usually consist of a series of distinct but interrelated programmes e.g., for financial grants, building materials, technical equipment, rehabilitation, food for work, and also assistance in the future development.

The important international agencies are United Nations Development Programme (UNDP), United Nations Economic and Social cooperation (UNESCO), United Nations Children's fund (UNICEF), World Health Organisation (WHO), United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), United Nations World Food Programme (WFP), Food Agricultural Organisation (FAO), International Labour Organisation (ILO), United Nations Fund for Population (UNFPA), International

Organisation for Migration (IOM), Asian Development Bank (ADB) and International Bank for Reconstruction and Development.

**International Federation of the Red Cross (WRC) and Red Crescent Societies** It is the ' world's largest humanitarian organisation. Its main mission, broadly speaking, is to improve the situation of the world's most vulnerable people.

**Department for International Development (DFID)** It aims at funding and providing support to disaster relief programmes.

**USAID** In majority of the cases, United States Aid Programme does not directly involve itself in disaster relief. It is more concerned with monitoring and reporting on disaster preparedness and response activities. There may, however, be a provision through partner NGOs for short term food aid to disaster victims.

**World Bank** the Disaster Management Facility of the World Bank has been established to streamline disaster prevention and mitigation initiatives connected with all the activities pertaining to disaster management. It has been doing a lot of work in the area of disaster mitigation.

**UNDP** Although the agreement does not allow UNDP to participate in relief operations unless specially requested, it does receive all information on the nature and extent of disaster damage and loss of life. Its broad aim is to design responsive structures as well as implement prevention and mitigation strategies.

**UNICEF** It contributes by donating funds to the Prime Minister's National Relief Fund. It regularly meets with the government of the affected country in order to facilitate a more coordinated disaster response mechanism.

**UNOCHA** This office of the United Nations is mandated by the UN General Assembly to coordinate humanitarian assistance of the UN family as well as that of international humanitarian actions. A Regional Office of the UNOCHA for Asia and the Pacific operates from Bangkok, Thailand.

### **To Do Activity**

Collect the news coverage on the Global Ebola epidemic in 2014 or any other world's deadliest disaster from that year's magazines, journals and news clippings. Make a list of the factors that have made the reconstruction and rehabilitation process a means of development in the affected areas. Visualise the ways these factors could be further improved and pen them down.

## **5.2 International Strategy for Disaster Reduction**

Continuing the context provided above, given the increasing concern about the impact of disasters, the UN General Assembly declared 1990-1999 as the International Decade for Natural Disaster Reduction (IDNDR). Under the theme 'Building a Culture of Prevention', work was done to advance a wider commitment to activities that could reduce the consequences of natural disasters. *The Yokohama Strategy and Plan of Action for a Safer World* (Yokohama strategy), conceived at the World Conference on Natural Disaster Reduction in Yokohama in 1994, stressed that every country had the

sovereign and primary responsibility to protect its people, infrastructure and national, social or economic assets from the impact of natural disasters.

### **International Strategy for Disaster Reduction (ISDR)**

The International Strategy for Disaster Reduction (ISDR) was adopted during the 1999 IDNDR Programme Forum, held in July 1999 in Geneva, and ratified by the United Nations' Economic and Social Council (ECOSOC) and General Assembly during the second meeting of its Commission on Sustainable Development. More than 20 speakers at the CSD spoke in favour of the Strategy and the proposed institutional arrangements in November 1999, and a resolution to that effect was adopted.

The following is a summary of the International Strategy as agreed to during the July 1999 IDNDR Programme forum. While hazards are inevitable, and the elimination of all risk is impossible, there are many technical measures, traditional practices, and public experience that can reduce the extent or severity of economic and social disasters. Hazards and emergency requirements are a part of living with nature, but human behaviour can be changed. In the words of the Secretary General, "We must, above all, shift from a culture of reaction to a culture of prevention. Prevention is not only more humane than cure; it is also much cheaper... Above all, let us not forget that disaster prevention is a moral imperative, no less than reducing the risks of war".

### **Vision**

"To enable all communities to become resilient to the effects of natural, technological and environmental hazards, reducing the compound risks they pose to social and economic vulnerabilities within modern societies and to proceed from protection against hazards to the management of risk through the integration of risk prevention into sustainable development."

### **Goals**

1. Increase public awareness of the risks that natural, technological and environmental hazards pose to modern societies.
2. Obtain commitment by public authorities to reduce risks to people, their livelihoods, social and economic infrastructure, and environmental resources.
3. Engage public participation at all levels of implementation to create disaster resistant communities through increased partnership and expanded risk reduction networks at all levels.
4. Reduce the economic and social losses of disasters as measured, for example, by Gross Domestic Product.

### **Objectives**

1. Stimulate research and application, provide knowledge, convey experience, build capabilities and allocate necessary resources for reducing or preventing severe and recurrent impacts of hazards, for those people most vulnerable.
2. Increase opportunities for organizations and multidisciplinary relationships to foster more scientific and technical contributions to the public decision making process in matters of hazard, risk and disaster prevention.
3. Develop a more proactive interface between management of natural resources and risk reduction practices.
4. Form a global community dedicated to making risk and disaster prevention a public value.

5. Link risk prevention and economic competitiveness issues to enhance opportunities for greater economic partnerships.
6. Complete comprehensive risk assessments and integrate them within development plans.
7. Develop and apply risk reduction strategies and mitigation measures with supporting arrangements and resources for disaster prevention at all levels of activity.
8. Identify and engage designated authorities, professionals drawn from the widest possible range of expertise, and community leaders to develop increased partnership activities.
9. Establish risk monitoring capabilities, and early warning systems as integrated processes, with particular attention being given to emerging hazards with global implications such as those related to climate variation and change, at all levels of responsibility.
10. Develop sustained programs of public information and institutionalized educational components pertaining to hazards and their effects, risk management practices and disaster prevention activities, for all ages.
11. Establish internationally and professionally agreed standards / methodologies for the analysis and expression of the socioeconomic impacts of disasters on societies.
12. Seek innovative funding mechanisms dedicated to sustained risk and disaster prevention activities.

### **Implementation**

- Conduct a national audit or assessment process of existing functions necessary for a comprehensive and integrated national strategy of hazard, risk and disaster prevention, projected over 510- and 20-year time periods.
- Conduct dynamic risk analysis with specific consideration of demographics, urban growth, and the interaction or compound relationships between natural, technological and environmental factors.
- Build, or where existing, strengthen regional/sub regional, national and international approaches, and collaborative organizational arrangements that can increase hazard, risk and disaster prevention capabilities and activities.
- Establish coordination mechanisms for greater coherence and improved effectiveness of combined hazard, risk and disaster prevention strategies at all levels of responsibility.
- Promote and encourage knowhow transfer through partnership and among countries with particular attention given in the transfer of experience amongst those countries most exposed to risks.
- Establish national, regional/sub regional, and global information exchanges, facilities, or websites dedicated to hazard, risk and disaster prevention, linked by agreed communication standards and protocols to facilitate interchange.
- Link efforts of hazard, risk and disaster prevention more closely with the Agenda 21 implementation process for enhanced synergy with environmental and sustainable development issues.
- Focus multiyear risk reduction strategies on urban concentration and megacity environments. Institute comprehensive application of land use planning and programmes in hazard prone environments.
- Develop and apply standard forms of statistical recording of risk factors, disaster occurrences and their consequences to enable more consistent comparisons.

- Undertake periodic reviews of accomplishments in hazard, risk and disaster reduction efforts at all levels of engagement and responsibility.
- Study the feasibility of specific alternative funding and resource allocation modalities that can ensure continued commitment to sustained risk and disaster prevention strategies.

### **Inter Agency Secretariat of the ISDR**

The Inter Agency Secretariat of the ISDR (UN/ISDR) is the focal point within the UN system for coordination of strategies and programs for disaster reduction and ensuring compatibility between disaster reduction activities and activities in the socioeconomic and humanitarian fields. “The Secretariat also serves as an international clearinghouse for the identification, management and dissemination of information pertaining to the current state of knowledge and the range of activities underway that could contribute to the progress of disaster risk reduction efforts around the world.

The Secretariat also develops advocacy campaigns to promote wider understanding about natural hazards and disaster risk to motivate a worldwide commitment to disaster reduction. A particularly important role is to encourage both policy and advocacy studies through national committees, networks or platforms dedicated to disaster reduction, closely aligning regional initiatives.

The Secretariat plays a *facilitating* role, bringing agencies, organisations and different disciplines together on a common platform to deliberate on the *scope* of disaster risk reduction. Furthering the end, the Secretariat supports the Inter Agency Task Force on Disaster Reduction in developing universal policies/innovative strategies on disaster reduction.

The Task Force, supported by the ISDR Secretariat, formulated in 2001 a framework for action for the implementation of ISDR with four main objectives

1. To increase public awareness to understand risk, vulnerability and disaster reduction.
2. To promote the commitment of public authorities to disaster reduction.
3. To stimulate multidisciplinary and intersect oral partnerships, including the expansion of risk reduction networks.
4. To improve scientific knowledge about the causes of natural disasters, as well as the effects that natural hazards and related technological and environmental disasters have on societies.

### **In Pursuing these Objectives, the Framework for Action Proposed, Outlines the Following Areas of Common Concern**

- Recognition and incorporation of special vulnerability of the poor and socially marginalised groups in disaster reduction strategies.
- Environmental, social and economic vulnerability assessment with special reference to health and food security.
- Ecosystems management, with particular attention given to the implementation of Agenda 21.
- Landuse management and planning, including appropriate land use in rural, mountain and coastal areas, as well as unplanned urban areas in megacities and secondary cities.
- National, regional and international legislation with respect to disaster reduction.



## Regional Cooperation

A particular issue area in regional cooperation is sharing and management of common environmental units, for example over an expanse of the ocean. More regional cooperation is needed to institute risk reduction regarding shared resources. As explained by Pardeep Sahni and Madhavi Malalgoda Ariyabandu (2003), there is need for networking of knowledge and expertise at the regional level to develop credible data base for development of policy science and risk identification for disaster mitigation policy on a regional scale.

The Pro Vention Consortium was launched in February 2000. As per the account given by Pardeep Sahni and Madhavi Malalgida Ariyabandu (2003), it comprises 43 governments, international organisations, academic institutions, banks, private sector organisations and civil society organisations. Some of the notable members are the Munich Re, University of Kyoto, Japan, University of Pennsylvania, Renaissance Reinsurers, Asian Development Bank, United Nations Development Programme (UNDP), International Federation of Red Cross and Red Crescent Societies among many more international institutes of repute.

Disasters have close linkages with Development. At times, it is development that causes disasters and there are occasions when after disasters, new development takes place. The Disaster Risk Index developed by UNDP has made an attempt to bringforth the relationship between development and disaster risk based on scientific, methodical and systematic analysis of data. Eight Millennium Development Goals (MDG)

1. Eradicating Extreme Poverty and Hunger.
2. Achieving Universal Primary Education.
3. Promoting Gender Equality and Empowering Women.
4. Reducing Child Morality.
5. Improving Maternal Health.
6. Combating HIV/AIDS, Malaria and other Diseases.
7. Ensuring Environmental Sustainability.
8. Developing a Global Partnership for Development”.

These goals have been set up by the General Assembly of the United Nations to be achieved by the year 2015.

### To Do Activity

Try to interview any government official working in the field of disaster management in your area and find out about the government's disaster management plan for your locality/colony/town/city. Ascertain your own role as well as your neighbours' role within the broad plan and prepare an outline of a disaster management strategy based on this information.

## 5.3 International Frameworks

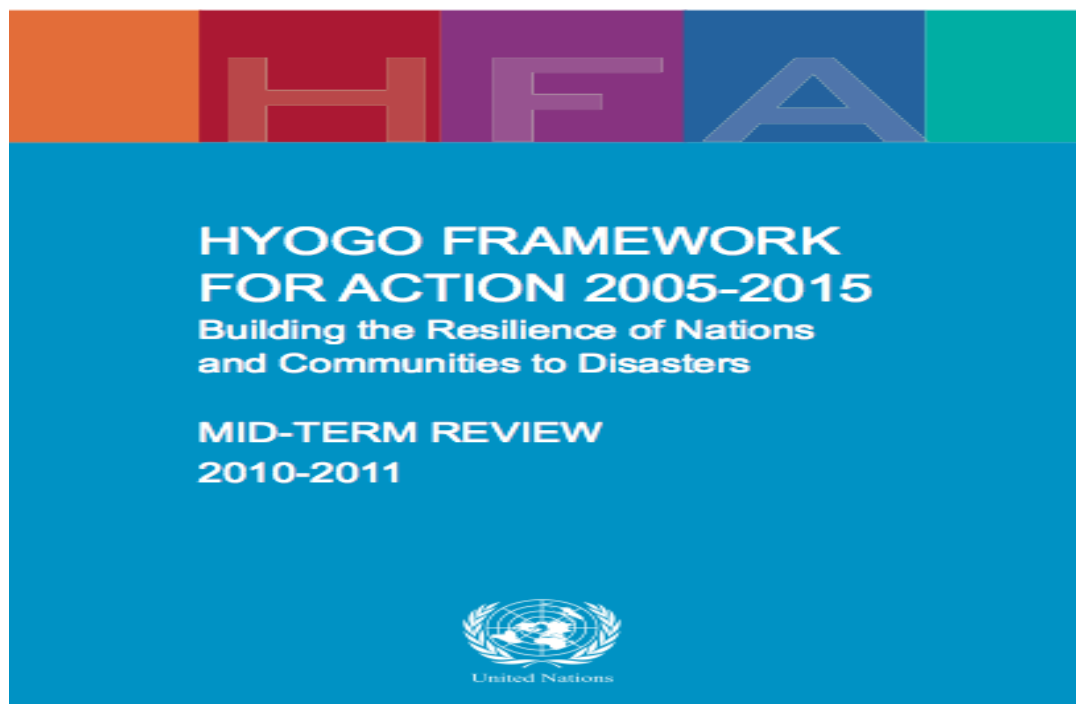
### Hyogo Framework (20052015)

The Hyogo Framework for Action 20052015 Building the Resilience of Nations and Communities to Disasters (HFA) is the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. “The HFA is a 10year plan to make the world safer from natural hazards. It was endorsed by the UN General Assembly following the 2005 World

Disaster Reduction Conference. It was developed and agreed on with the many partners needed to reduce disaster risk governments, international agencies, disaster experts and many others bringing them into a common system of coordination. The HFA outlines five priorities for action, and offers guiding principles and practical means for achieving disaster resilience. Its goal is to substantially reduce disaster losses by 2015 by building the resilience of nations and communities to disasters. This means reducing loss of lives and social, economic, and environmental assets when hazards strike.

**Priority Action 1** Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation. Countries that develop policy, legislative and institutional frameworks for disaster risk reduction and that are able to develop and track progress through specific and measurable indicators have greater capacity to manage risks and to achieve widespread consensus for, engagement in and compliance with disaster risk reduction measures across all sectors of society

**Priority Action 2** Identify, assess and monitor disaster risks and enhance early warning. The starting point for reducing disaster risk and for promoting a culture of disaster resilience lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities to disasters that most societies face, and of the ways in which hazards and vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge.



**Priority Action 3** Use knowledge, innovation and education to build a culture of safety and resilience at all levels. Disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerabilities and capacities.

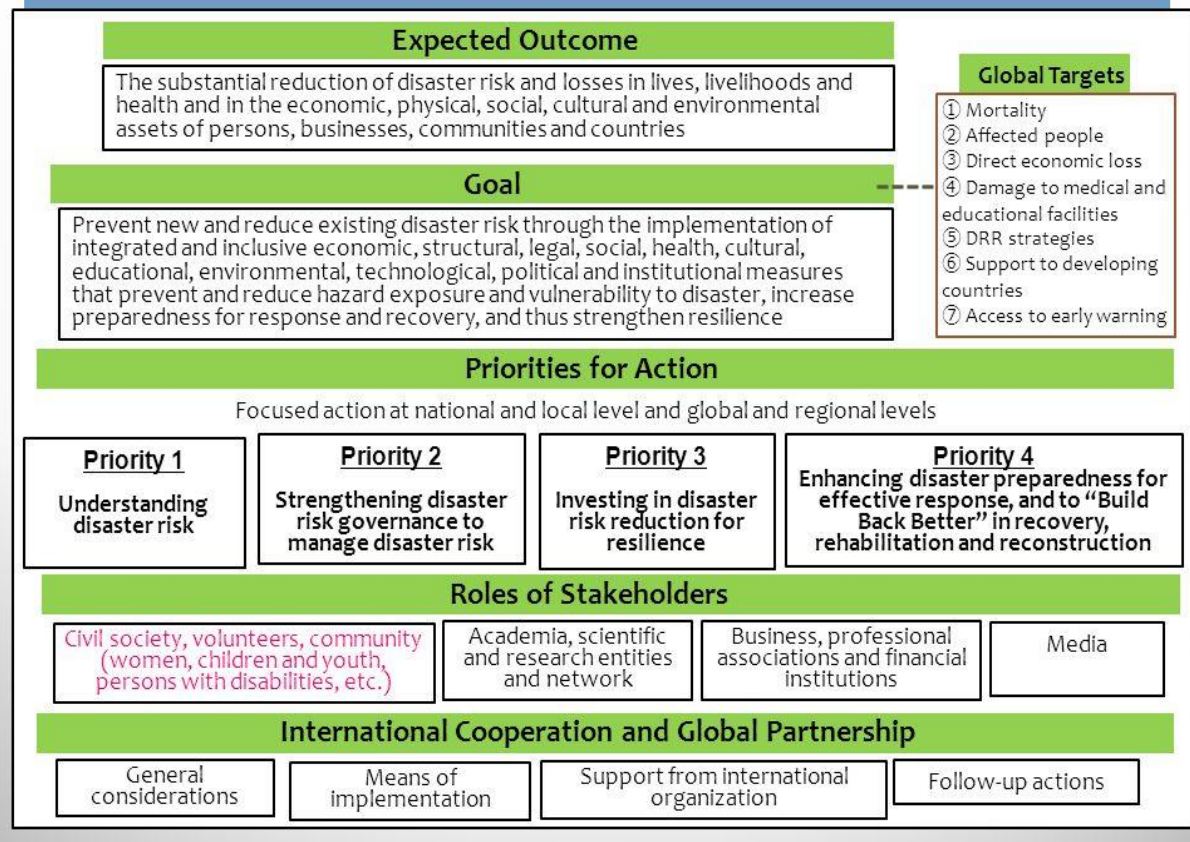
Priority Action 4 Reduce the hidden hazard factors. Debacle dangers identified with evolving social, financial, natural conditions and land use, and the effect of risks related with geographical occasions, climate, water, atmosphere changeability and environmental change, are tended to in division improvement arranging and projects just as in post catastrophe circumstances.

Priority Action 5 Strengthen calamity readiness for viable reaction at all levels. On occasion of fiasco, effects and misfortunes can be significantly diminished if specialists, people and networks in peril inclined regions are decidedly ready and prepared to act and are outfitted with the learning and capacities with regards to viable catastrophe the board.

### **Sendai Framework (2015 2030)**

The Sendai Framework was received by UN Member States on 18 March 2015 at the Third UN World Conference on Disaster Risk Reduction in Sendai City, Miyagi Prefecture, Japan. "The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is the primary real understanding of the post-2015 improvement motivation, with seven targets and four needs for activity. It was supported by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR). The Sendai Framework is a 15-year deliberate, non-official understanding which perceives that the State has the essential job to lessen calamity hazard however that obligation ought to be imparted to different partners including neighbourhood government, the private division and different partners. It goes for the accompanying result: The generous decrease of fiasco hazard and misfortunes in lives, employments and wellbeing and in the monetary, physical, social, social and ecological resources of people, organizations, networks and nations. The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015 Building the Resilience of Nations and Communities to Disasters. It is the result of partner discussions started in March 2012 and intergovernmental arrangements held from July 2014 to March 2015, which were bolstered by the UNISDR upon the solicitation of the UN General Assembly. UNISDR has been entrusted to help the usage, development and survey of the Sendai Framework."

## Sendai Framework for Disaster Risk Reduction 2015-2030



**Figure 5.3 Sendai Framework**

### The Seven Global Targets

- a. "Generously diminish worldwide fiasco mortality by 2030, meaning to lower normal per 100,000 worldwide death rates in the decade 20202030 contrasted with the period 20052015.
- b. Substantially lessen the quantity of influenced individuals all around by 2030, planning to lower normal worldwide figure per 100,000 in the decade 2020 2030 contrasted with the period 20052015.
- c. Reduce direct debacle financial misfortune in connection to worldwide total national output (GDP) by 2030.
- d. Substantially diminish catastrophe harm to basic foundation and interruption of fundamental administrations, among them wellbeing and instructive offices, including through building up their flexibility by 2030.
- e. Substantially increment the quantity of nations with national and neighbourhood fiasco hazard decrease methodologies by 2020.
- f. Substantially upgrade worldwide collaboration to creating nations through satisfactory and feasible help to supplement their national activities for execution of this Framework by 2030.
- g. Substantially increment the accessibility of and access to multi danger early cautioning frameworks and calamity hazard data and evaluations to the general population by 2030.

**The Four Priorities for Action (Source Sendai Framework for Disaster Risk Reduction [https://en.wikipedia.org/wiki/Sendai\\_Framework\\_for\\_Disaster\\_Risk\\_Reduction](https://en.wikipedia.org/wiki/Sendai_Framework_for_Disaster_Risk_Reduction))**

**Priority 1** Understanding disaster risk Disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be used for risk assessment, prevention, mitigation, preparedness and response.

**Priority 2** Strengthening disaster risk governance to manage disaster risk Disaster risk governance at the national, regional and global levels is very important for prevention, mitigation, preparedness, response, recovery, and rehabilitation. It fosters collaboration and partnership.

**Priority 3** Investing in disaster risk reduction for resilience Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment.

**Priority 4** Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction. The growth of disaster risk means there is a need to strengthen disaster preparedness for response, take action in anticipation of events, and ensure capacities are in place for effective response and recovery at all levels. The recovery, rehabilitation and reconstruction phase are a critical opportunity to build back better, including through integrating disaster risk reduction into development measures.

Execution guides for the Sendai Framework. The Sendai Framework for Disaster Risk Reduction outlines the worldwide course throughout the following 15 years. During the conferences and exchanges that prompted its finish, solid calls were made to create useful direction to help usage, guarantee commitment and responsibility for by all partners, and fortify responsibility in a fiasco chance decrease. Passage 48 (c) of the Sendai Framework calls upon the United Nations Office for Disaster Risk Reduction (UNISDR), specifically, to help the execution, development and audit of this structure through creating proof based and handy direction for usage in close joint effort with States, and through preparation of specialists; fortifying a culture of anticipation in important partners". So as to help the procedure, various focused on Sendai Framework usage aides will be created.

**To Do Activity**

Do a physical and social profile of a disaster prone region or country and list the hazards it is exposed to. Find out the vulnerabilities and recommend what should be done to address the concerns. What can be done to protect the environment? Make an Action Plan.

**5.4 S and T Institutions for Disaster Management in India**

Specialized Organizations, for example, the Indian Meteorological Department (tornado/seismic tremor), Central Water Commission (floods), Building Material and Technology Promotion Council (development laws), Bureau of Indian (standards), Defence Research and Development Organization (atomic/natural), Directorate General Civil Defence give explicit specialized help to coordination of calamity reaction and the board capacities.

Catastrophe the board depends intensely upon the contributions from different science and innovation organizations. To be sure, real enhancements in a debacle the board endeavors might be ascribed to advancements in science and innovation. As emergency the board is multidisciplinary in nature, the significant research is done in a few part savvy innovative work associations. The Administrative Reforms Committee has prescribed that The National Disaster Management Authority, helped by NIDM, may encourage a typical stage between the science and innovation associations and the clients of important advances. Such components might be made operational both at the Union and State levels. Institutional advancement for catastrophe the board in the nation has plainly endured by virtue of scarcity of expertly qualified faculty. While government workers and other senior staff in associations like the police, military and civil bodies have given an influential position and their administration will keep on being required, it is time that extraordinary consideration is paid to the long felt need to professionalize fiasco the board in the nation.

The accepted procedures in calamity the executives are the methodologies and techniques idealized by a few created nations and India can exploit from introduction to these practices. It is, in this way, alluring the likelihood of reciprocal concurrences with outside governments for trade of encounters and gaining from their documentation and research endeavours be completely investigated.

### **Millennium Development Goals**

“In September 2000, leaders of 189 countries gathered at the United Nations headquarters and signed the historic Millennium Declaration, in which they committed to achieving a set of eight measurable goals that range from halving extreme poverty and hunger to promoting gender equality and reducing child mortality, by the target date of 2015.

### **The Millennium Development Goals (MDGs)**

- Goal 1 Eradicate extreme poverty and hunger
- Goal 2 Achieve universal primary education
- Goal 3 Promote gender equality and empower women
- Goal 4 Reduce child mortality
- Goal 5 Improve maternal health
- Goal 6 Combating HIV/AIDs, malaria, and other diseases
- Goal 7 Ensure environmental sustainability
- Goal 8 Develop a global partnership for development

The MDGs were progressive in giving a typical language to achieve worldwide understanding. The 8 objectives were reasonable and simple to convey, with an unmistakable estimation/checking system. Generous advancement has been made in regards to the MDGs. The world has officially understood the first MDG of splitting the outrageous destitution rate by 2015. Be that as it may, the accomplishments have been uneven. The MDGs are set to lapse in 2015 and the talk of a post2015 motivation proceeds. The emphasis is currently on structure a supportable existence where ecological maintainability, social consideration, and monetary improvement are similarly esteemed.

The MDG Fund contributed legitimately and in a roundabout way to the accomplishment of the MDGs. It received a comprehensive and far reaching way to deal with the MDGs. The methodology was guided continuously Declaration and its accentuation on improvement as a right, with focused consideration coordinated towards customarily minimized gatherings, for example, ethnic minorities, indigenous gatherings, and ladies.



## **The Global Consultation of Sustainable Development Goals**

The Rio+20 gathering (the United Nations Conference on Sustainable Development) in Rio de Janeiro, June 2012, aroused a procedure to build up another arrangement of Sustainable Development Goals (SDGs) which will carry on the force created by the MDGs and fit into a worldwide advancement system past 2015.

In light of a legitimate concern for making another, individuals focused, advancement motivation, a worldwide interview was led on the web and disconnected. Common society associations, natives, researchers, scholastics, and the private division from around the globe were all effectively occupied with the procedure. Exercises included topical and national counsels, and the My World review driven by the United Nations Development Group. Particular boards were additionally held and given ground to encourage intergovernmental talks. The UN Secretary General introduced a combination of the aftereffects of these meeting forms. In July 2014, the UN General Assembly Open Working Group (OWG) proposed an archive containing 17 objectives to be advanced for the General Assembly's endorsement in September 2015. This report set the ground for the new SDGs and the worldwide improvement motivation spreading over from 20152030.

## **Sustainable Development Goals (SDGs) as proposed by the OWG**

Goal 1 End poverty in all its forms everywhere

Goal 2 End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

Goal 3 Ensure healthy lives and promote wellbeing for all at all ages

Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5 Achieve gender equality and empower all women and girls

Goal 6 Ensure availability and sustainable management of water and sanitation for all

Goal 7 Ensure access to affordable, reliable, sustainable, and modern energy for all

Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all

Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

Goal 10 Reduce inequality within and among countries

Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12 Ensure sustainable consumption and production patterns

Goal 13 Take urgent action to combat climate change and its impacts

Goal 14 Conserve and sustainably use the oceans, seas, and marine resources for sustainable development

Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss

Goal 16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels

Goal 17 Strengthen the means of implementation and revitalize the global partnership for sustainable development.”



### The SDG Fund and the SDGs

The SDG Fund is the main collaboration component explicitly intended to accomplish the future SDGs. Expanding upon the experience and exercises educated of the past MDG Achievement Fund (2007-2013), the SDG Fund expects to go about as an extension in the change from MDGs to SDGs, giving encounters on the most proficient method to accomplish a reasonable and comprehensive world post-2015 through its coordinated and multidimensional joint projects.

#### To Do Activity

Explain what specific aspects you will address while designing a strategy for relocating a disaster affected community.

## 5.5 India's Commitment at International Forum COP21

### Paris Agreement

The Paris agreement, formally known as the Conference of Parties (CoP) protocol on combating climate change, is the world's first comprehensive regime on tackling the phenomenon within the United Nations Framework Convention on Climate Change (UNFCCC). Adopted by 195 countries in Paris in December 2015, the regime will take effect after it is ratified by at least 55 countries responsible for 55% of global emissions.



**Figure 5.5 Paris Summit COP 21 (Source United Nations Official Website ([www.un.org](http://www.un.org)))**

The arrangement of Paris' COP21 atmosphere summit is gone for diminishing the worldwide temperature alteration which is as of now liquefying ice sheets and raising seas undermining the lives of creatures and plants. "The nations that met at Paris consented to hold the expansion in the worldwide normal temperature to well beneath 2°C above poromechanical levels and furthermore try endeavour to confine the temperature increment to 1.5°C. For this, the key is diminishing the reliance on petroleum products and cutting the ozone depleting substance emanations. Temperatures have effectively expanded by about 1°Celsius (1.8 degrees Fahrenheit) since poromechanical occasions. So as to accomplish the long haul temperature objective, the nation's expect to achieve worldwide topping of ozone harming substance emanations as quickly as time permits, says the understanding." It, nonetheless, perceives that cresting of ozone harming substances outflow will take more time for creating nations.

According to the understanding, created nations should "keep leading and spearheading" by attempting economywide supreme outflow to decrease targets, while creating nations should keep upgrading their relief endeavours. They are additionally urged to move after some time towards economywide outflow decrease or restriction focuses in the light of various national conditions. Nations will set national focuses for decreasing ozone depleting substance discharges like clockwork. In excess of 180 nations have just submitted focuses for the primary cycle starting in 2020.

### Major Deliverables

According to reports by the Intergovernmental Panel on Climate Change (IPCC), "global warming beyond 2 degrees Celsius will lead to a rise in the number of extreme climate events. A major goal of the Paris agreement, therefore, is to keep global temperature increase well below 2 degrees Celsius and to pursue efforts to limit it to 1.5 degrees Celsius. The pact and its progress will be reviewed every five years. In addition, the developed countries have pledged \$100 billion a year in climate finance for developing countries by 2020 with a commitment to further raise it in the future." While there is no penalty for countries that miss their targets, the agreement has transparency rules to help encourage countries do achieve their obligations.

### India's Importance

The significance of New Delhi's support to the climate pact lies in the fact that India accounts for over 4% of global emissions and is crucial for crossing the threshold mark of 55%. The world's top two polluters—the US and China —that together account for 40% of global carbon emissions, have already ratified the document. Once the 55% barrier is crossed, the climate regime will become legally binding on all signatories after a period of 30 days.

### India's Obligations

The three key moral commitments India has made at Paris are as follows

1. The country had committed to reducing its emissions intensity by 3335 per cent by 2030, compared with 2005 levels. Since it seems to have achieved about 1215 per cent efficiency improvements in the last decade, India is on target to easily achieve its target and could even exceed it.

India has tried to balance its carbon emissions with its economic growth objectives by not setting an outright pollution reduction goal. But, being a part of the global climate change regime, India will have significant obligations to meet under the treaty. The country will have to reduce its carbon footprint by 3335% from its 2005 levels. This has to be achieved by 2030.



2. A key result area for India will come in the form of the reduction of emission intensity targets, which basically is the volume of emissions per unit of gross domestic product (GDP). "The country will have

to diversify its power generation sources and shift them significantly towards renewable energy sources to reduce volumes of emissions per unit of GDP. In numbers, by 2025, India will need a 175 giga watt power production capacity from non-fossil fuel sources.

The private sector accounts for more than half of the electricity consumption in India. Commercial buildings account for only 9 per cent of the total power consumption in the country. However, the commercial sector is growing fast, and efficiency improvements here can make a big difference to the country's future power consumption and hence total emissions. Since most of the big projects in the country are yet to come, energy experts see it also an opportunity to move to cutting edge technology quickly.

So far, the energy efficiency movement in the private sector has had little to do with government regulations. According to the non-profit Carbon Disclosure Project, more and more Indian companies are now reporting their energy productivity data voluntarily." Data in the last three years show that the reporting companies are making improvements in energy efficiency.

The country is planning to boost its energy production from renewable sources to 40 percent of total by 2030. In order to achieve this target, the government has set fivefold increase in renewable energy capacity in the next five years to 175 gigawatts. Of the 175 gigawatts of renewable energy that India plans to create, 100 gigawatts are just solar energy. Compare this with the world's current solar capacity of about 200 gigawatts. India's current capacity is just 5 gigawatts, according to the consulting firm Bridge to India, but rapidly growing. India has to create 60 gigawatts of wind power while the current capacity is about 25 gigawatts. Paradoxically, despite the current problems in wind power in India, experts say that wind power targets are far easier to achieve than solar targets. India's electricity consumption starts rising when the sun begins to go down, and so a high proportion of solar energy will affect grid stability. Wind, on the other hand, does not go down completely at any point. In many places, it blows harder at night and early mornings, when solar power is either absent or present in negligible amounts. So, wind power is considered a perfect balance to large solar plants. India's wind power potential has been revised of late from 48 gigawatts to above 1000 gigawatts, as the assessments of potential have now been done at a higher altitude.

3. India's third commitment is to increase the forest cover of the country and absorb 2.5 to 3 giga tonnes of carbon from the atmosphere. "The treaty requires India to increase its forest cover by five million hectares along with an improvement in the quality of green cover of an equal measure. It is expected that increased forest coverage will help India absorb massive carbon emissions from the atmosphere.

This means creating another five million hectares of forest, and improving the quality of another five million hectares of forest. Forestry experts see some problems here as well. India's definition of forests is ambiguous, and includes even tree cover in urban areas. While that may be enough for removing carbon from the atmosphere, it may not serve the country's social goals as much. Even if India fulfils all its INDC commitments (Intended Nationally Determined Contributions for reducing greenhouse gas emissions), the country's emissions are set to rise significantly."

According to the consortium Climate Action Tracker, India's emissions will increase 90 per cent by 2030, if current policies are any indication. This is due to the high absolute growth in thermal power,

as the current base of thermal power is very large. A doubling of emissions will put Indian emissions at about 9 per cent of the global total by 2030, compared to about 6 per cent now. India's per capita emissions will still be low, but its population is expected to grow for another six decades.

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# Block 4

# Social Entrepreneurship

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# Chapter 1

## Understanding Entrepreneurial Framework

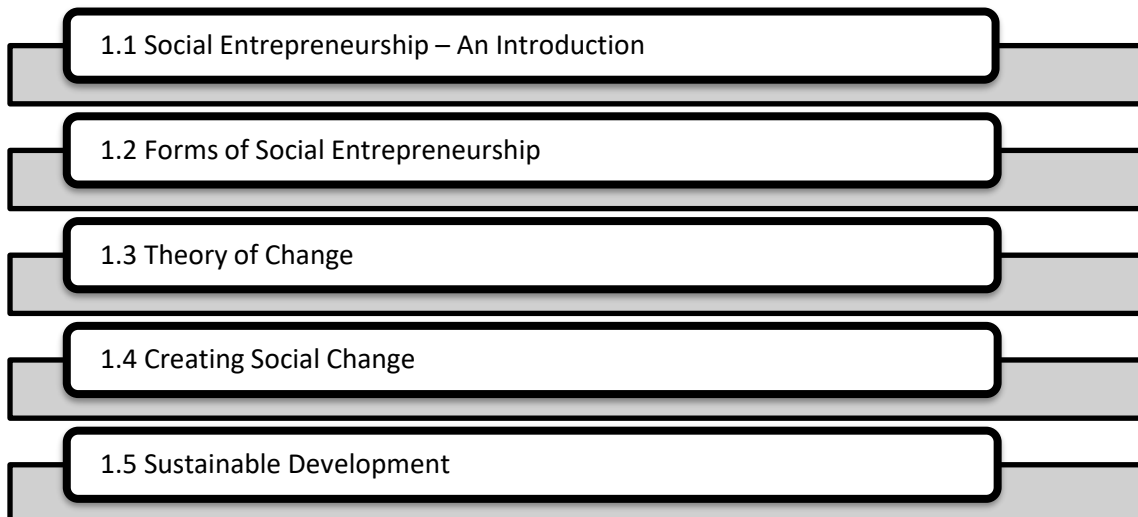
### Introduction

With the growing need of sustainability in business development, the emergence of business tools to find solutions to the problems at distinct levels has emerged. This has resulted in the development of initiatives to improve the community and hence benefit the society at large. Social entrepreneurship deals with the recognition of social problems and attaining a social change by using entrepreneurial principles, processes, and operation. This unit introduces the concept of social entrepreneurship and further delineates the characteristics of social entrepreneurs and concludes with the global scenario of social entrepreneurship.

### Objectives

- To understand the concept of social entrepreneurship.
- To identify the various forms of social entrepreneurship.
- To understand the theory of change, transformative nature of social entrepreneurship
- To Identify the social business opportunities
- To gain insights into the Millennium Ecosystem Assessment

### Structure



### 1.1 Social Entrepreneurship

The concept of social enterprise is increasingly used to identify a 'different way' of doing business, which occurs when enterprises are created specifically to pursue social goals. Social entrepreneurship is defined as "innovative, social value-creating activity that can occur within or across the nonprofit, government, or business sectors". It can be observed here that on a broader front, all enterprises, whether commercial or social, aim at generating social value. In this context, a social enterprise primarily aims at creating social value, as opposed to magnifying shareholder wealth.



The European Commission gives the term 'social enterprise' the following meaning 'an operator in the social economy whose main objective is to have a social impact rather than make a profit for their owners or shareholders. It operates by providing goods and services for the market in an entrepreneurial and innovative fashion and uses its profits primarily to achieve social objectives. It is managed in an open and responsible manner and, in particular, involves employees, consumers and stakeholders affected by its commercial activities' (Social Business Initiative, October 2011).

Following are some of the features of social entrepreneurship

- Having a social purpose
- Engaging in trading activities to achieve social purpose (at least in part)
- Not distributing profits to individuals
- Holding assets and wealth in trust for community benefit
- Democratically involving members of its constituency in governance of organization
- Independent organization with accountability to defined constituency & wider community

### **The Socio-Economic Context of Social Entrepreneurship**

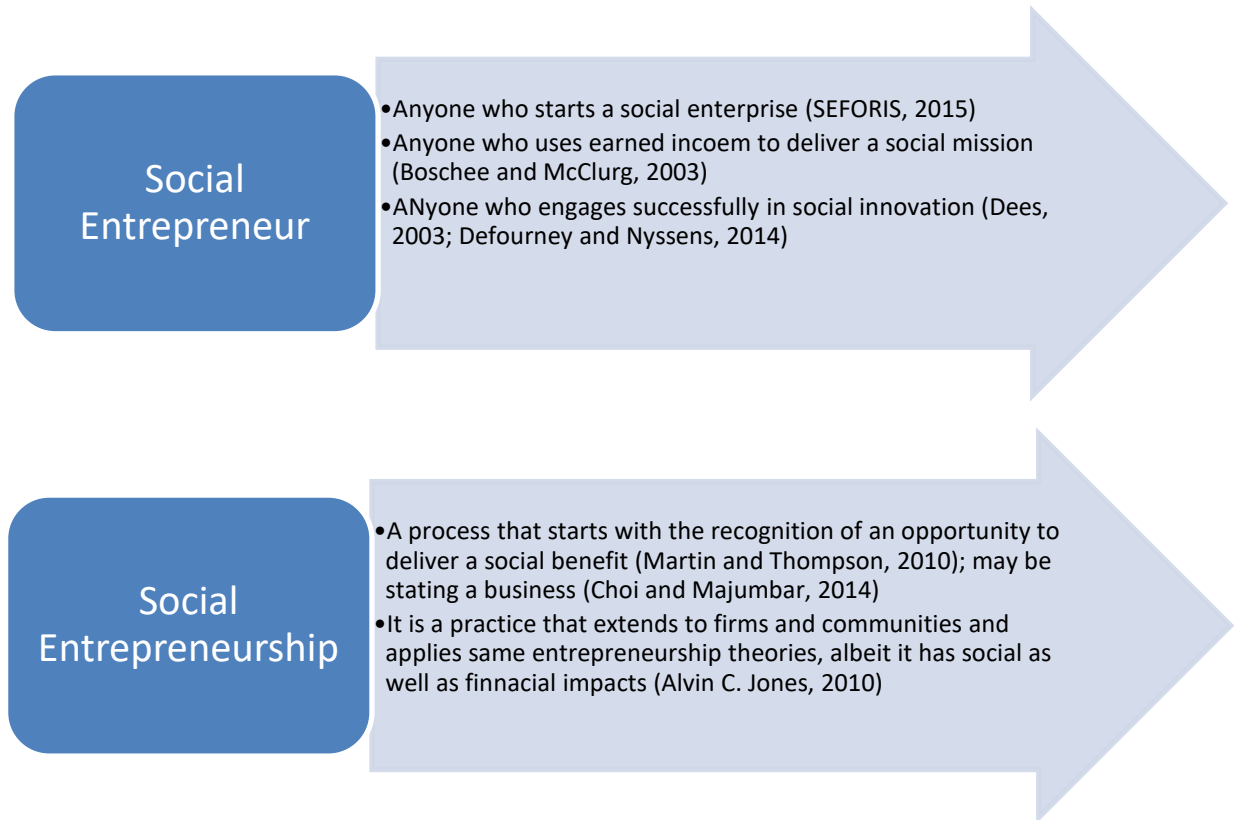
The socio-economic context of social entrepreneurship can be explained with the help of the following quotation.

"Today the public interest is not only served by the government, but also by new private actors, for example social entrepreneurs." - Professor Jacques Deforment (Moneystore.be, February 2013).

If we go through the concept of social entrepreneurship, it can be observed that social entrepreneurship overlaps with the traditional nomenclature of the socio-economic organizations. Social entrepreneurship is defined as dealing "with the recognition of social problems and attaining a social change by using entrepreneurial principles, processes, and operation". It is all about making a research to completely define a particular social problem and then organizing, creating, and managing a social venture to attain the desired change. The change may or may not include a thorough elimination of a social problem. It may be a lifetime process focusing on the improvement of the existing circumstances.

While a general and common business entrepreneurship means taking a lead to open up a new business or diversifying the existing business, social entrepreneurship mainly focuses on creating social capital without measuring the performance in profit or return in monetary terms. Along with social problems, social entrepreneurship also focuses on environmental problems. Child Rights foundations, plants for treatment of waste products, and women empowerment foundations are few examples of social ventures. Social entrepreneurs can be those individuals who are associated with non-profit and non-government organizations that raise funds through community events and activities. The key distinguishing factor between social enterprises and conventional enterprises is the underlying objective, which in case of social enterprise is the social purpose. An indicator of this social purpose is that the majority of any profits are reinvested or otherwise used to achieve the social mission of the enterprise.

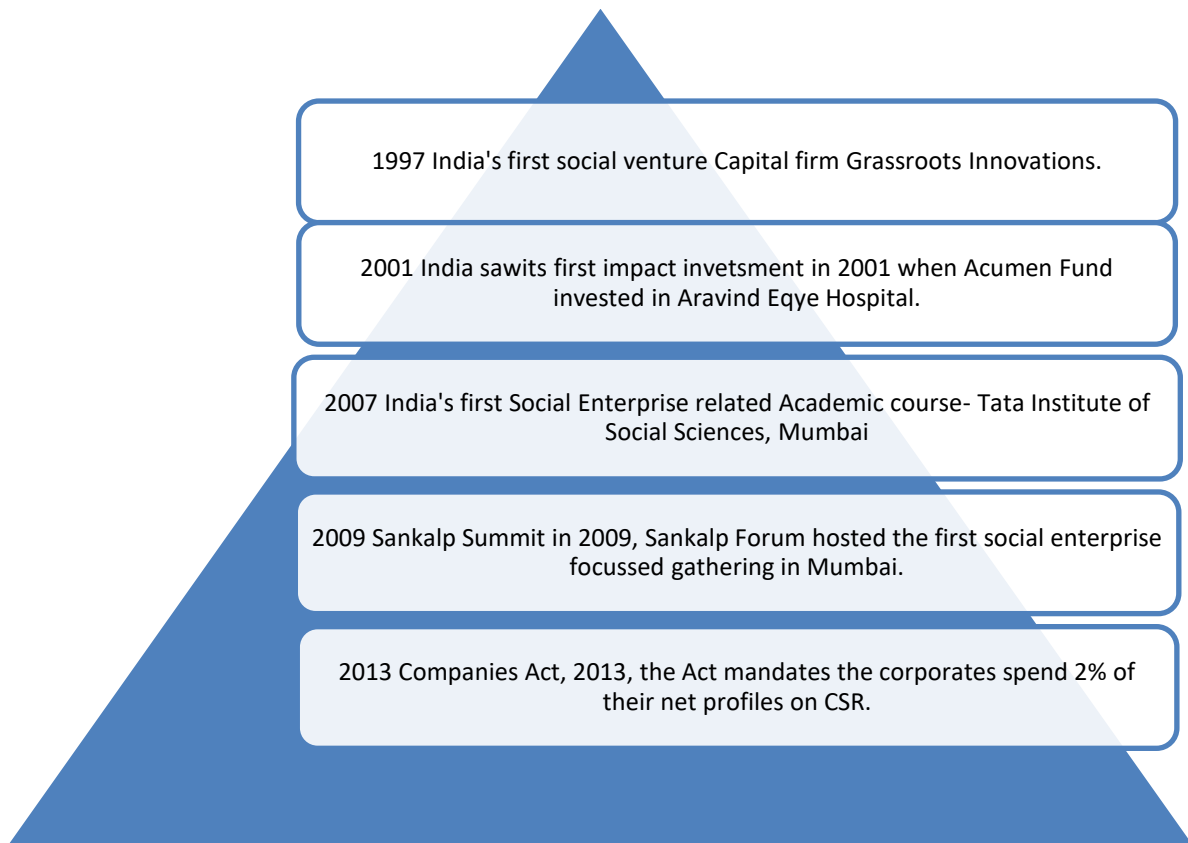
## Social Entrepreneur vs. Social Entrepreneurship



**Figure 1.1 Social Entrepreneur vs. Social Entrepreneurship**

### History of Social Entrepreneurship

The terms Social Entrepreneur and Social Entrepreneurship emerged into common parlance in the early 1980s, when Bill Drayton identified this process as a form of entrepreneurship that tried to find solutions to varied problems of humankind, especially the poor and the marginalized, in an entrepreneurial manner (Drayton, 2002). The following figure illustrates India's stand on social entrepreneurship.



**Figure 1.2 History of Social Entrepreneurship**

### Characteristics of Social Entrepreneur

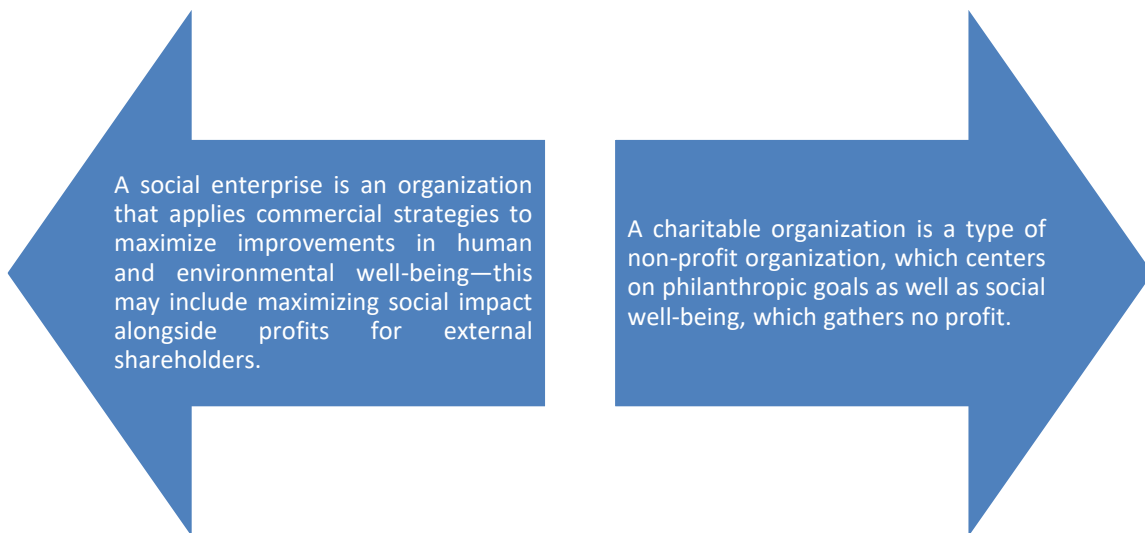
The key characteristics of social entrepreneurs (Dees, 2017) are as follows.



**Figure 1.3 Characteristics of Social Entrepreneurs**

### Social Entrepreneurship Vs. Charity

Although, social entrepreneurship and charity share similar objectives of benefitting the society at large by creating long-term solutions to complex problems, charities are limited in their scope of work as they primarily focus on the 'vulnerable groups' in societies. On the contrary, social entrepreneurs tend to deal with much wider issues that pertain to the quality of life vis-à-vis environment protection, employment, access to clean water and healthy food, immigration, education, energy, corruption, and democracy, among others.



**Figure 1.4 Social Entrepreneurship vs. Charity**

The present section introduces to the concept of social entrepreneurship and also highlights the emergence of the concept. The unit also talks about the key characteristics of social entrepreneurs, which determine the success of the social enterprise. We then discuss the differences between social entrepreneurship and charity.

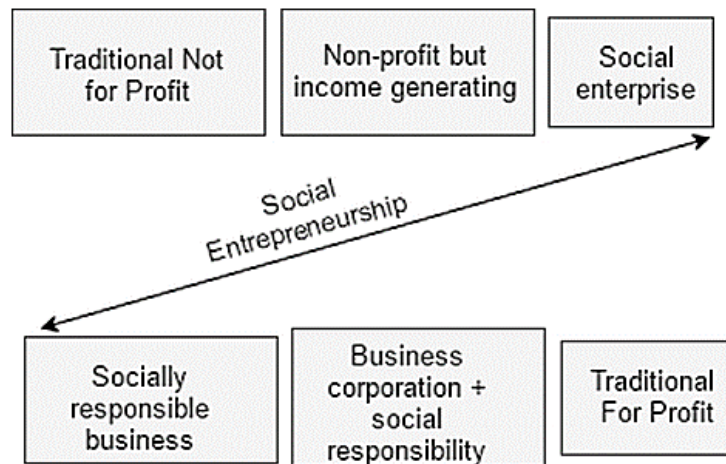
**To Do Activity**

Think of any one social enterprise and one business enterprise. Compare and contrast the working business models for both and then write down the pros and cons of each entrepreneurship model.

**1.2 Forms of Social Entrepreneurship**

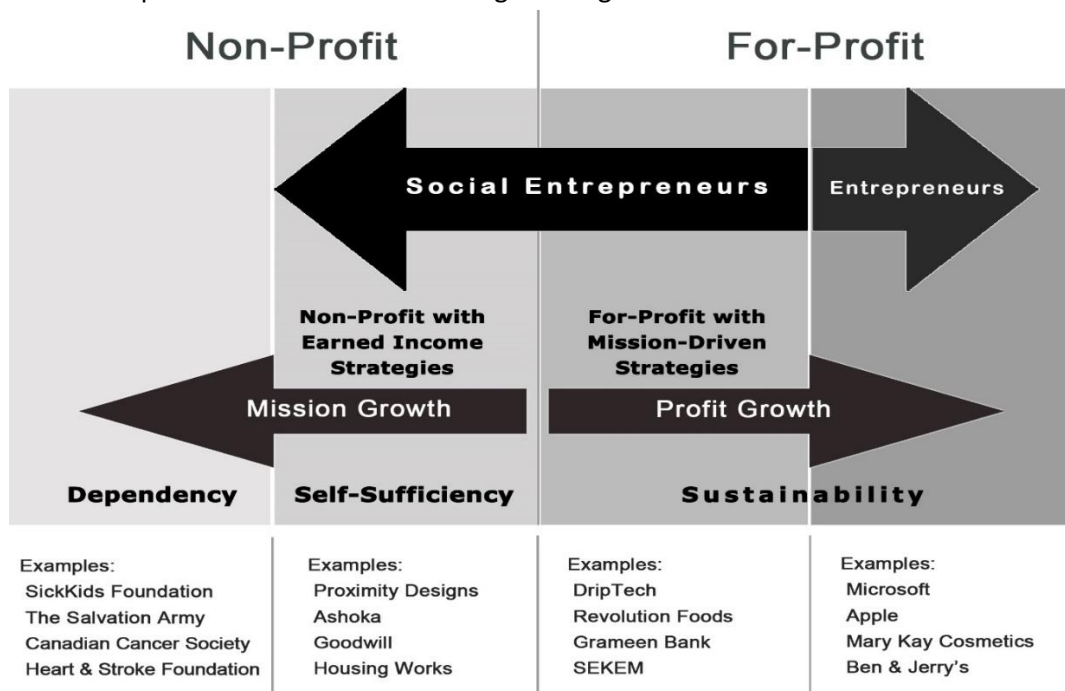
This section throws light on the different forms of social entrepreneurship. As discussed in unit I, social entrepreneurship is different from traditional entrepreneurship and aims at solving complex social issues. This unit explains the forms of social entrepreneurship with special reference to the profit and non-profit social entrepreneurship.

The different forms of social entrepreneurship can be categorized broadly into two heads, namely, for profit and not for profit entrepreneurs. The following figure highlights the distinction between the two forms based on the concept of social entrepreneurship and its underlying nature of integrating the commercial and social outcomes.



**Figure 1.5 Forms of Social Entrepreneurship**  
(Source Gandhi and Raina, 2018)

A detailed description of these two broad categories is given below



**Figure 1.6 The Entrepreneurship Spectrum Illustrating the Boundaries of Social Entrepreneurship**  
(Source Safina, 2012)

### For Profit Social Entrepreneurship

A for profit social entrepreneurship undertakes social and commercial entrepreneurial activities with the objective of achieving sustainability. In this case, the nature of organization in which a social entrepreneur operates is an integration of the social and the commercial. Also, such an organization is financially independent and has the potential to benefit its stakeholders, viz. the founders as well as the investors by providing the personal monetary gain.

### Not for profit Social Entrepreneurship

In contrast to the for-profit entrepreneurship, a not for profit social entrepreneurship strives to achieve self-sufficiency by undertaking hybrid commercial and social entrepreneurial activities. Thus, in this case, the organization in which a social entrepreneur operates is both social and commercial.

It may be noted that here, the profits and revenues that are generated out of the activities are utilized towards improving the delivery of social value in a more effective manner.

### Factors determining the selection of forms of Social Entrepreneurship

The choice of the form of social entrepreneurship is based on a number of factors. The key criteria that need to be taken care of while making a choice pertain to the distinction in these two forms based on the following parameters.

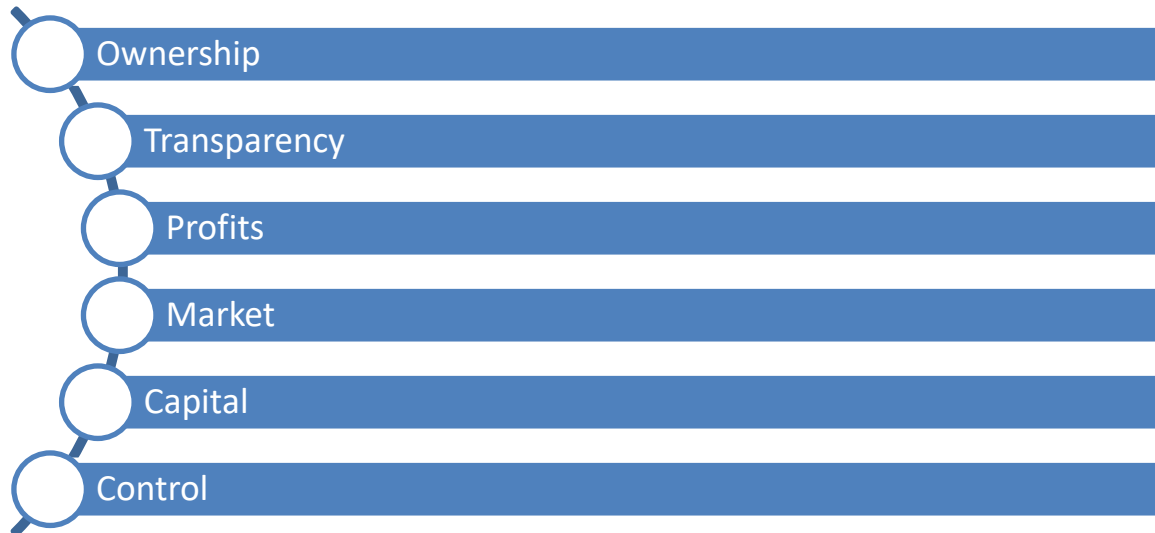


Figure 1.7 Parameters for Selecting the form of Social Entrepreneurship

### The Factors are Primarily Categorized into Two Domains

- Environmental factors
  - Internal environmental factors
  - External environmental factors
- Personal factors

The following figure describes the components of these factors in detail.

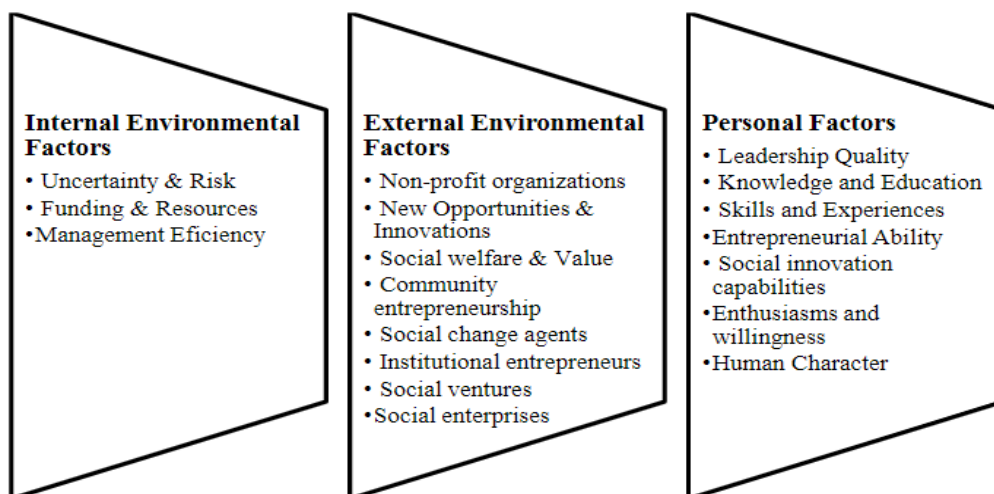


Figure 1.8 Factors Determining the Selection of forms of Social Entrepreneurship

(Source Faruk, Hasan and Islam, 2016)

The present section describes the two broad domains of social entrepreneurship – for profit and not for profit social entrepreneurship. A for profit social entrepreneurship undertakes social and commercial entrepreneurial activities with the objective of achieving sustainability. In contrast to the for-profit entrepreneurship, a not for profit social entrepreneurship strives to achieve self-sufficiency by undertaking hybrid commercial and social entrepreneurial activities. We also discussed the key factors that influence the choice of form of social entrepreneurship by analyzing the environmental as well as the personal factors.

**To Do Activity**

Identify up to 5 social entrepreneurs in your area. Classify them based on their objective (For profit or not for profit etc.). Discuss with them how they made the selection of the form of social enterprise. Write a one-page report on your observations.

**1.3 Theory of Change**

This section examines the nature of social entrepreneurship and highlights the underlying theory of change that lays the theoretical foundation for understanding the role of social entrepreneurship as a transformative change.

**Social Entrepreneurship as a Transformative Change**

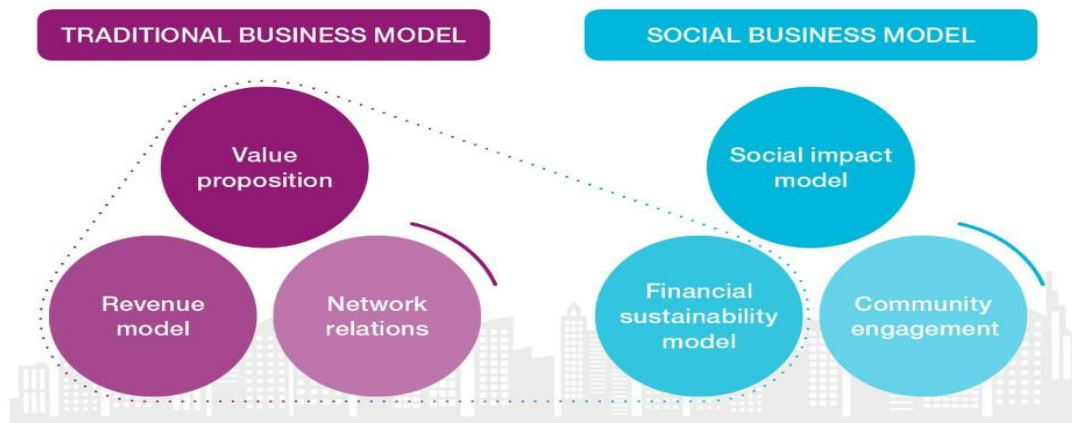
**Table 1.1 Social Entrepreneurship vs. Business Entrepreneurship**

<b>Basis of Distinction</b>	<b>Social Entrepreneurship</b>	<b>Business Entrepreneurship</b>
Emphasis on Individual vs. Team	The focus is more on gauging the feasibility of the project on the basis of individuals.	In this case, the decisions for the viability of the project are on the basis of team leadership.
Perceptions of Value	The value is reflected in the social benefit that is derived by the community at large and is attributable to the transformation witnessed in a vulnerable community.	The value is reflected in the profits of the enterprise, which are distributed among the shareholders and other stakeholders.
Measure of Profitability	The profitability of social enterprise is measured by the contribution made to support the social causes. Hence, social entrepreneurship can be regarded as a not for profit entrepreneurship.	The profitability of business entrepreneurship is measured through the benefits obtained by the stakeholders out of the profits earned by the organization.
Approach to wealth creation	The wealth is created by a social entrepreneur in order to transform community and hence, effect a social change.	The wealth created by a business entrepreneurship is primarily drive by the innovation integrated with the commercial strategies so as to provide direct benefit to the consumers.



Social entrepreneurship deals with the application of commercial strategies to solve complex social problems. This asserts that social entrepreneurship defines the challenges and applies theory of change to determine the different ways in which the social entrepreneurs can address these complex problems and solve them by using a specific set of interventions.

These are illustrated below:



**Figure 1.9 Social Business Model vs. Traditional Business Model**

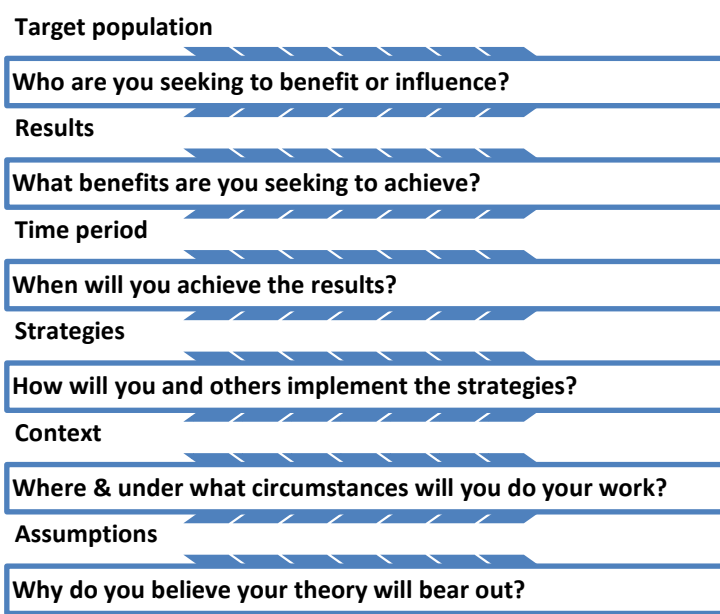
(Source <https://www.ericsson.com/en/trends-and-insights/networked-society-insights/social-business>)

### Theory of Change

Theory of change is described as a strategy that delineates the different ways in which a social enterprise will effect social change. The strategy is characterized as

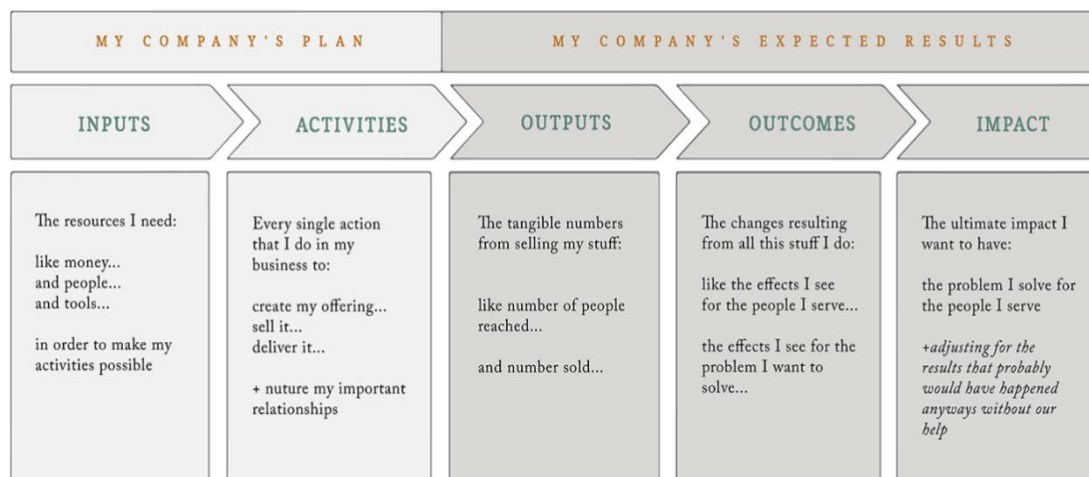
- Specific
- Measurable
- Contextualized

The theory of change primarily addresses the following questions



**Figure 1.10 Theory of Change – Foundation**

The following figure explains in detail the key components of change. It highlights the plans of the organization in terms of its inputs and activities and also the expected results in terms of outputs, outcomes and impact.

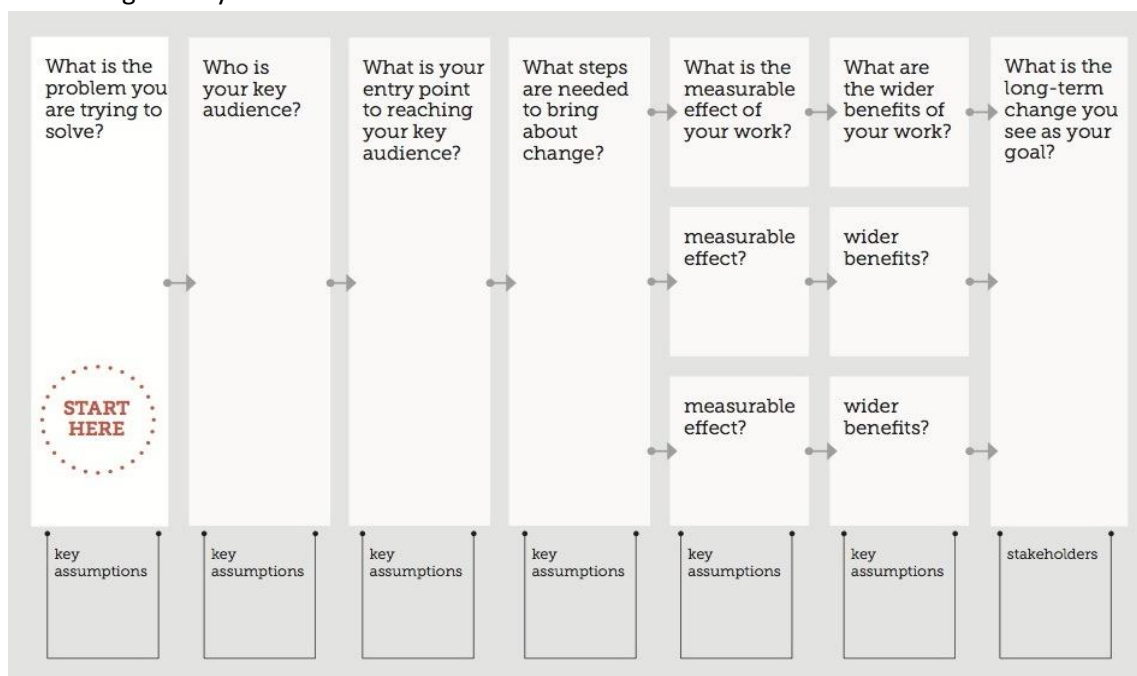


**Figure 1.11 Theory of Change – Plan and Expected Outcomes**

(Source <https://rankandfilemag.com/issue-10/theory-of-change-guide-for-social-impact-modeling/>)

**Activity**

Based on the theory of change foundation and plans and outcomes, create your own change plan in the following activity chart



(Source <https://diytoolkit.org/tools/theory-of-change/>)

In this section, we discussed about the role of social entrepreneurship as a transformative change agent. The basic objective of social entrepreneurship is to solve complex social problems by implementing the specific set of interventions. We then described the foundational questions that the theory of change addresses along with its plans and expected outcomes.

**To Do Activity**

Think of up to 3 social entrepreneurial ideas. For any one of them, assess what all are the potential contributions to the community and the society if the idea is implemented successfully.

**1.4 Creating Social Change**

This section introduces you to the process of creating social change. The process of creating this change is contingent upon certain factors such as the social value, legal structure, and community mapping, among others. This unit will provide detailed information on the key issues and concerns for creating a social change.

**Social Business Opportunities**

From the definition of social entrepreneurship, it can be asserted that social entrepreneurship aims at supporting a social cause. Hence, the opportunities for social entrepreneurs can be attributed to the need for creating social value so as to benefit the community at large. The most common path followed to achieve this objective is to identify the vulnerable segment of the society and find out their areas of needs. A social entrepreneur then tries to formulate the strategies to solve these problems and contribute towards the upliftment and development of that vulnerable community. Thus, we can say that the key motivation for driving social entrepreneurship is the creation of social value as opposed to the creation of wealth. It integrates the profit as well as non-profit ventures so as to generate positive returns for the society at large. In short, the prime focus of social entrepreneurship is to resolve environmental, social, and cultural issues and not maximizing the financial gains.

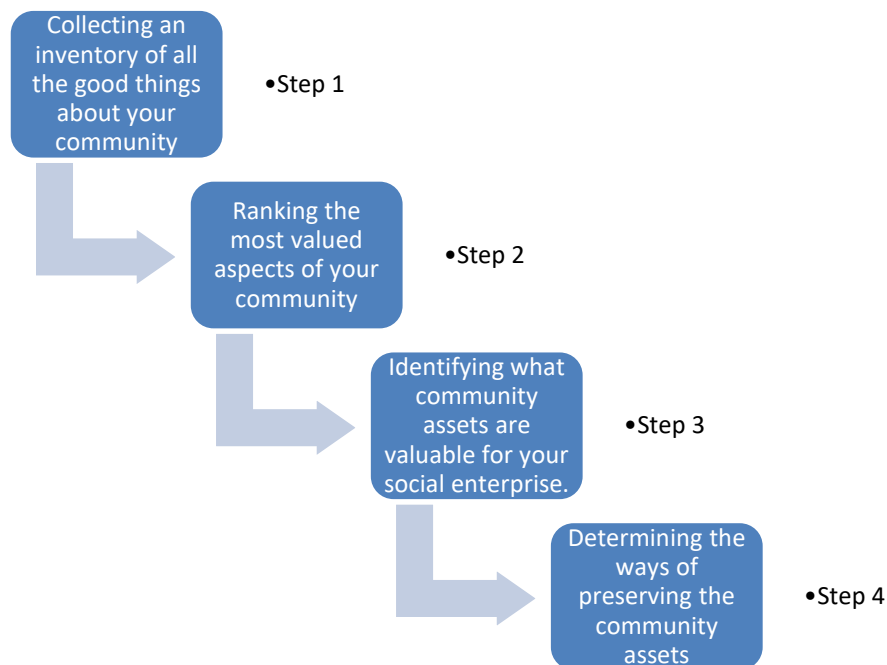
**Legal Structure**

A legal structure may be defined as the legal business structure that a social organization may take. A legal structure determines the operations of the organization by defining the elements vis-à-vis amount of tax liability, eligibility for the grant in aid or the investments etc. For social entrepreneurship, there are different types of legal structures that can be employed while setting up an enterprise. However, due to diverse rules and complexities involved for each structure, it is very important to decide the legal structure judiciously. Some of the examples of legal structures in India include the following

- Unincorporated association
- Sole Trader
- Trust
- Partnership
- Company Ltd by Shares (CLS)
- Charitable Incorporated Organization (CIO)
- Company Ltd by Guarantee (CLG)
- Community Interest Company, limited by guarantee (CIC – CLG)
- Community Interest Company, limited by shares (CIC – CLS)
- Limited Liability Partnership
- Community Benefit Society (CBS)
- Co-operative Society (previously IPS)

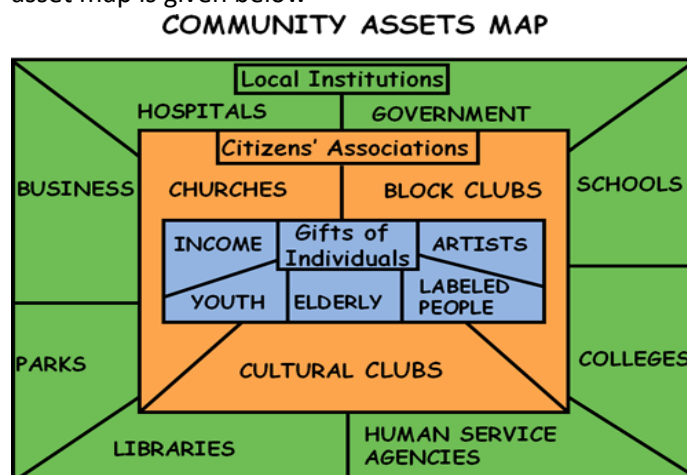
## Community Asset Mapping

The term “community asset mapping” may be defined as a tool that provides a framework to target the local audience and to further engage them in the activities of a social enterprise. In simple words, it looks at the community through a transformed lens. The prime objective behind community asset mapping is to involve the community and take it ahead as a part of the social venture and hence strive towards the overall sustainable growth and development of community at large. The process of community asset mapping involves the following steps



**Figure 1.12 Steps Involved in Community Asset Mapping**

A sample community asset map is given below

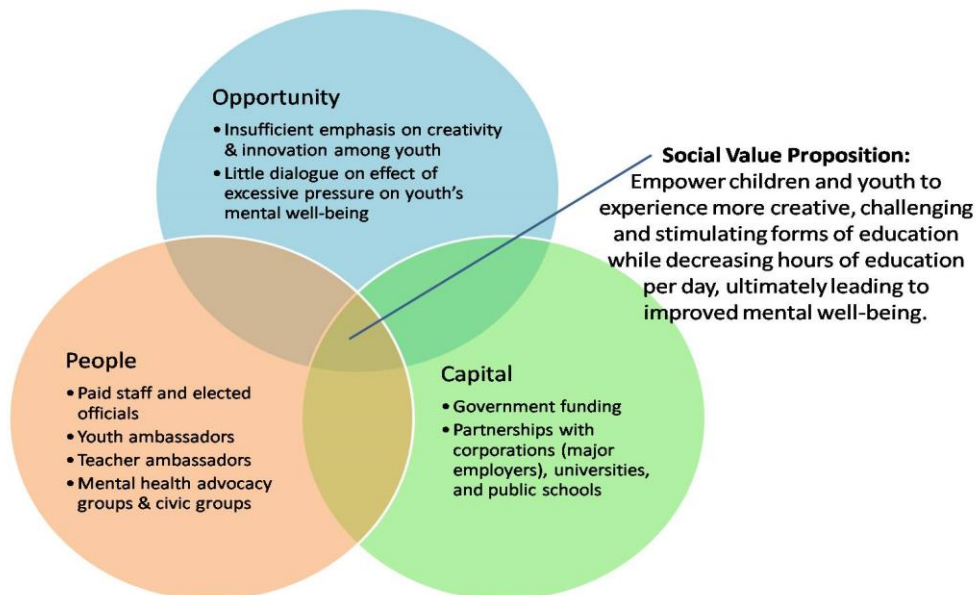


**Figure 1.13 Sample Community Asset Map**

(Source <https://myemail.constantcontact.com/The-Vitality-of--ABDC-and-the-Movers---Shakers-in-Research-Action-for-a-Healthy---Wealthy-Continental-African-Population.html?soid=1105463482084&aid=Sn8r3-QFKeA>)

## Social Value Proposition

A social value proposition (SVP) defines the "cause" or driving "force" behind a social enterprise. It plays a significant role for the company by stating the social cause for the setting up the organization. It may be noted here that as the social enterprise grows, the focus shifts from the initial social value proposition to the internal organizational growth. Hence, it can be argued that social value proposition plays a central role in defining the operations of the company. The following figure illustrates this concept in more detail



**Figure 1.14 Social Value Proposition**

(Source Social Entrepreneurship Framework (Skillen et al., 2007, Entrepreneurship in the Social Sector))

This unit throws light on the social change that the social entrepreneurship aims to achieve. It first emphasizes on the process of social change and also the factors that influence this process. The process of creating this change is contingent upon certain factors such as the social value, legal structure, community mapping etc. All these factors are discussed in detail in the unit.

### To Do Activity

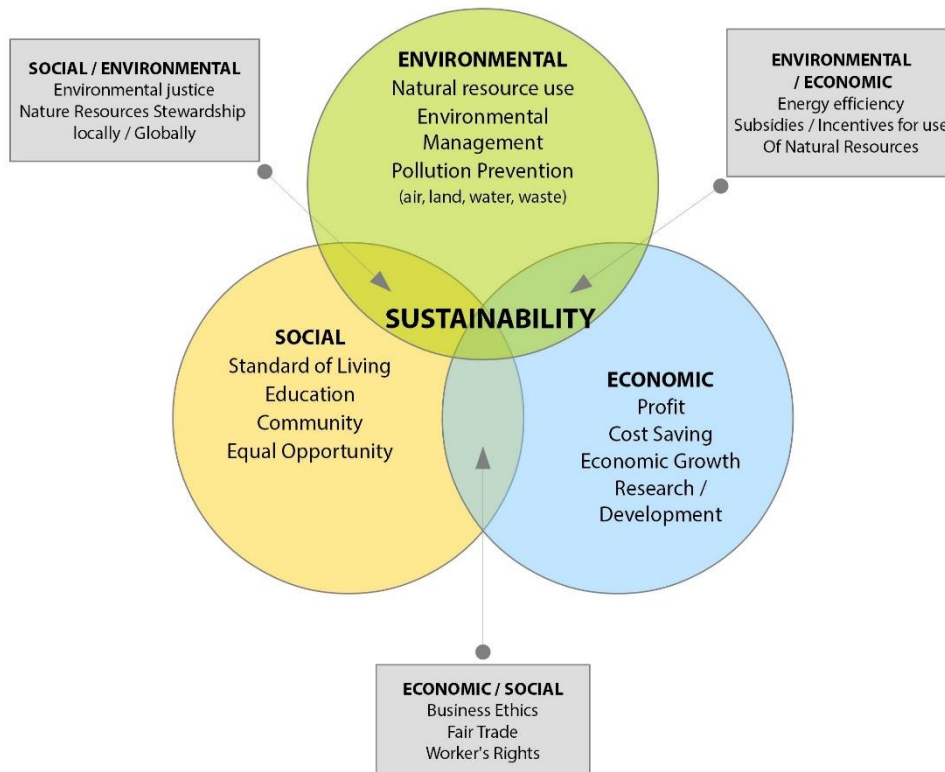
Search on the internet or in other sources and identify the various incentives that are offered by the Government of India for promoting social entrepreneurship in India. Analyze the change brought in by these initiative in terms of growth of entrepreneurial set ups in the country.

## 1.5 Sustainable Development

This section lays emphasis on the sustainable development in context of social entrepreneurship. It describes the concept of sustainability and its importance for the community. Social entrepreneurship aims at adopting innovative measures to effect social changes, taking into consideration the social and ecological spheres.

## Concept of Sustainable Development and its Importance

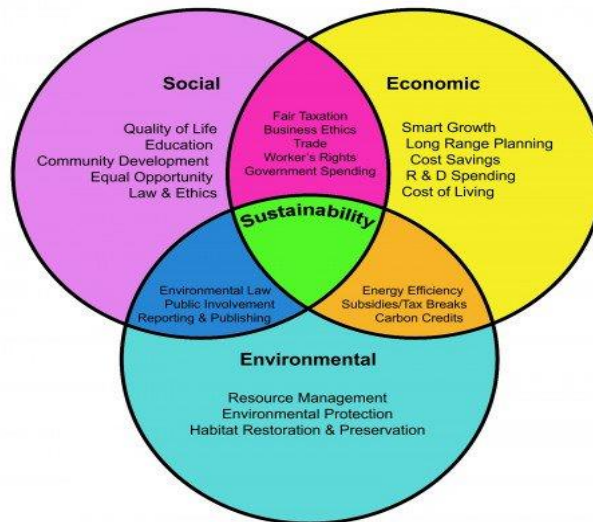
In business parlance, the concept of sustainable development can be defined as follows “For the business enterprise, sustainable development means adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future.” (International Institute for Sustainable Development, 1992, p. 11). The purpose of sustainable development revolves around balancing our social, economic, and environmental needs, thereby allowing prosperity for both ‘now’ and ‘future’ generations. The following figure depicts the concept of sustainability.



**Figure 1.15 Sustainable Development and Social Entrepreneurship**  
(Source Warden, 2016)

## Factors Affecting the Sustainable Development

The factors that determine the extent of sustainability are categorized into three spheres. From a wider perspective, it is evidently in the interest of the business to operate within a healthy environment and economy. It is a widely accepted notion that the growing and sustainable economies in the developing countries together will provide the greatest prospects for expanding markets. These factors are also described in the figure below.



**Figure 1.16 Factors Affecting Sustainable Development for Social Entrepreneurship**  
(Source Chris, 2018)

### The Millennium Ecosystem Assessment

Millennium Ecosystem Assessment, 2005 is defined as “An assessment of the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being (called for by the United Nations Secretary-General in 2000)”. The Millennium Assessment emphasizes on

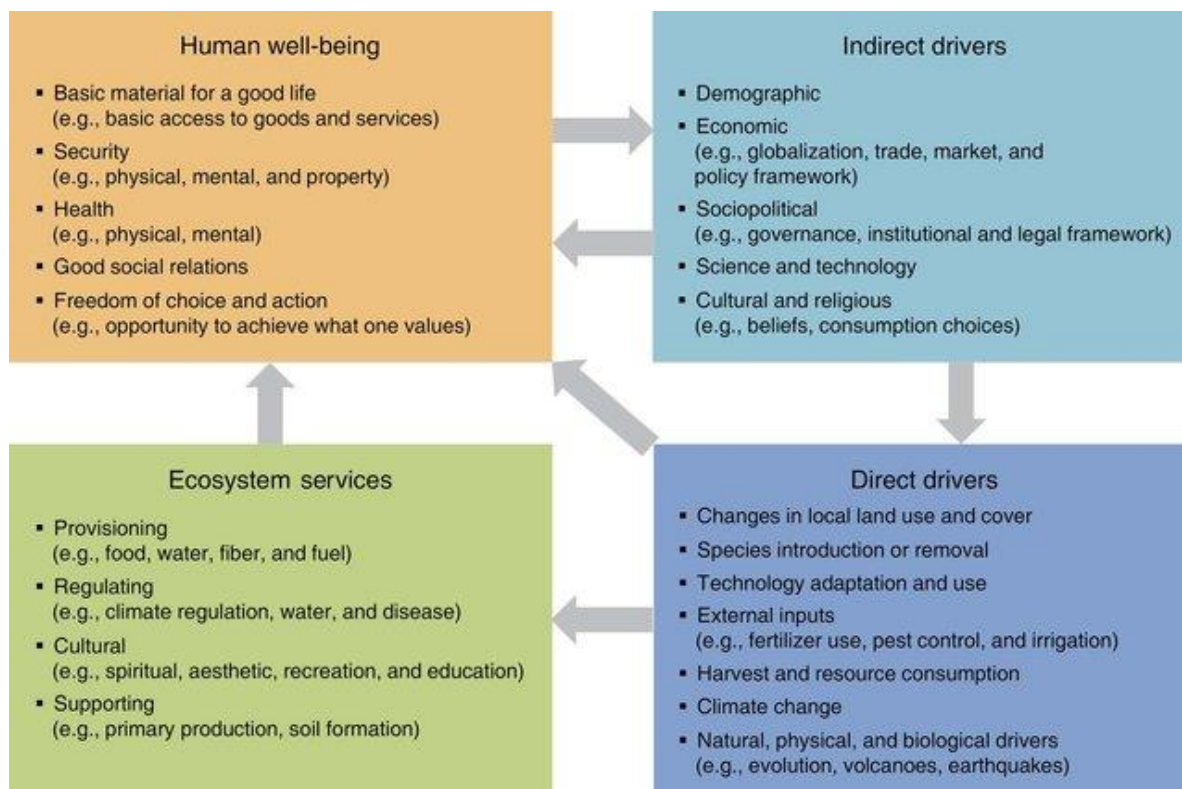
- How humans have transformed the ecosystems?
- How these changes in the ecosystem services have further influenced human well-being?
- How ecosystem changes may affect people in future decades?
- What types of responses can be adopted at local, national, or global scales to improve ecosystem management and thereby contribute to human well-being and poverty alleviation?

The details about the assessment can be found at <https://youtu.be/aIGeYfQGZeg>

#### To Do Activity

Observe the present business scenario and prepare a millennium ecosystem assessment framework. From this framework, identify one major change that you would like to introduce through social entrepreneurship venture.





**Figure 1.17 Millennium Ecosystem Assessment**

(Source Wang et al., 2015)

This Section lays emphasis on the sustainable development in context of social entrepreneurship. Social entrepreneurship aims at adopting innovative measures to effect social changes, keeping into consideration the social and ecological spheres. The purpose of sustainable development revolves around balancing our social, economic and environmental needs, thereby allowing prosperity for both ‘now’ and ‘future’ generations. The following figure depicts the concept of sustainability. From a wider perspective, it is evidently in the interest of the business to operate within a healthy environment and economy.

### Model Questions

1. How is social entrepreneurship different from charity?
2. What are the different forms of social entrepreneurship?
3. How does social entrepreneurship effect social change?
4. Explain in detail the concept of community asset mapping.
5. What is social value proposition? Why is it important for a social entrepreneurship?
6. What is sustainable development? What are the elements of sustainable development?
7. Explain Millennium Ecosystem Assessment in detail.

### Suggested Readings

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2. 5 Things Great Social Entrepreneurs Do Differently – Tori Utley, Forbes (2018).
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5. How Social Entrepreneurs Change the World – Steve Denning, Forbes, 2015
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# Chapter 2 Building A Sustainable Business Model

## Introduction

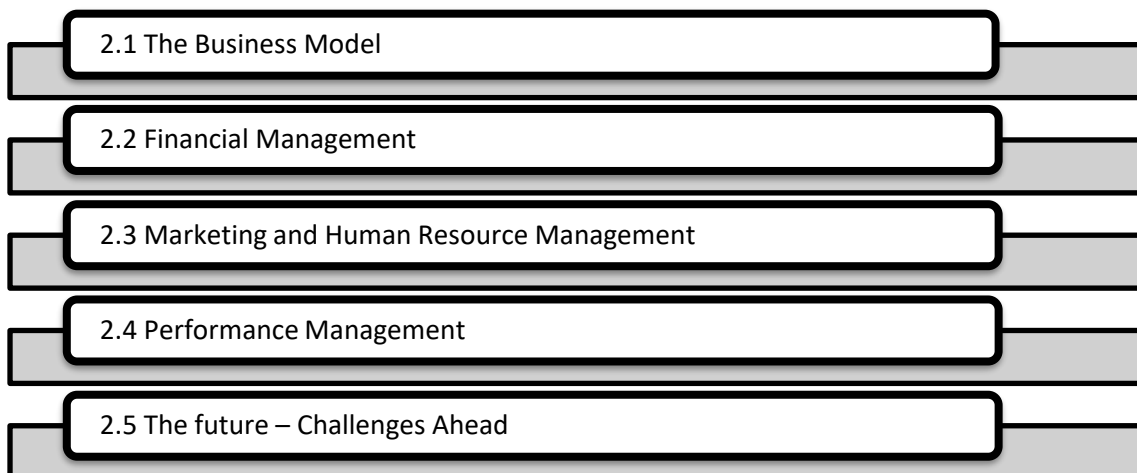
A deeper understanding about sustainability is a must for every business. We can say that a sustainable company is one which has its objectives, purpose and actions equally aligned in financial, economic and social concerns. Achieving sustainability for a business is a tough task and not an easy one. It includes many complexities and issues that are to be taken care of.

Role of business model in social venture

## Objectives

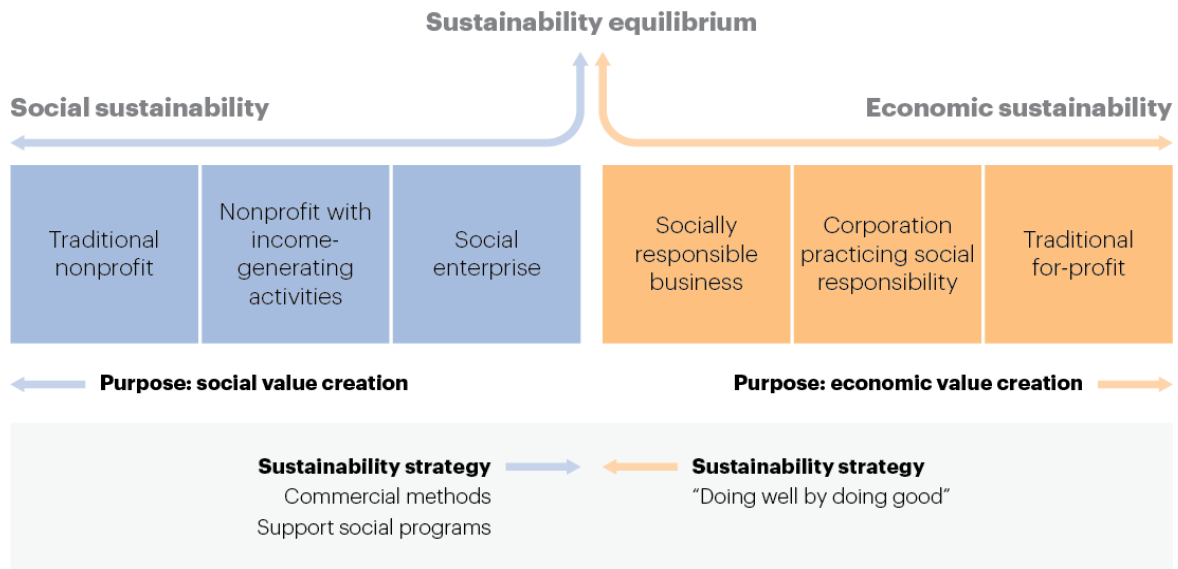
- To understand role of business model in a social venture and social impact theory
- To gain insight in to the source of funding for social entrepreneurs
- To gain insight on the various social marketing strategies
- To learn to apply various tools for measuring impact
- To describe the challenges for social entrepreneurs

## Structure



### 2.1 The Business Model

We can define a business model as a structure, design or framework that a business has to follow in order to ensure value to its customers and clients. Social enterprises apply the solutions of the business problems to the social problems and try to find out solutions for the same. Their major objective is to achieve sustainability by enabling the nonprofit organizations to be able to support themselves financially rather than being dependent on donations and government grants.



**Figure 2.1 Social Venture and Sustainability**










(Source The Four Lenses Strategic Framework, Virtue Ventures LLC, 2010; A.T. Kearney Analysis)

### Equitable Distribution of Value

The utmost important factor for any business model is the value proposition. It is really very important that the products and services yield tangible and profitable results for the target customers of the company. It's the concept of value proposition that will distinguish a company from its competitors. For any company possible areas for innovation and adaption are certainly production and marketing. It will include all the set of activities related to providing and marketing of a good or service to the consumer. At the production side it will consist of activities related to creation of value and from the marketing perspective the activities will lead to capturing of value.

### The Business Model Canvas

Business Model Canvas is defined as strategic management and lean startup template for developing new or documenting existing business models. It is a visual chart with elements describing a firm's or product's value proposition, infrastructure, customers, and finances. It assists firms in aligning their activities by illustrating potential trade-offs.

<b>KEY PARTNERSHIPS</b>  Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform?	<b>KEY ACTIVITIES</b>  What Key Activities we need to do to deliver our Value Proposition through desired channels and Customer Relationships?	<b>VALUE PROPOSITIONS</b>  What value do we deliver to the customer? Which one of our customer's problems are we helping to solve?	<b>CUSTOMER RELATIONSHIP</b>  What type of relationship our Customer Segments expect us to establish and maintain with them?	<b>CUSTOMER SEGMENTS</b>  For whom are we creating value? Who are our most important customers?
<b>KEY RESOURCES</b>  What Key Resources do our Value Propositions, Channels, Customer Relationships and Revenue Streams require?	Which customer needs are we satisfying? What bundles of products and services are we offering to each Customer Segment?	<b>CHANNELS</b>  Through which Channels do our Customer Segments want to be reached? How are we reaching them now?		
<b>COST STRUCTURE</b>  What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?		<b>REVENUE STREAM</b>  For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying?		

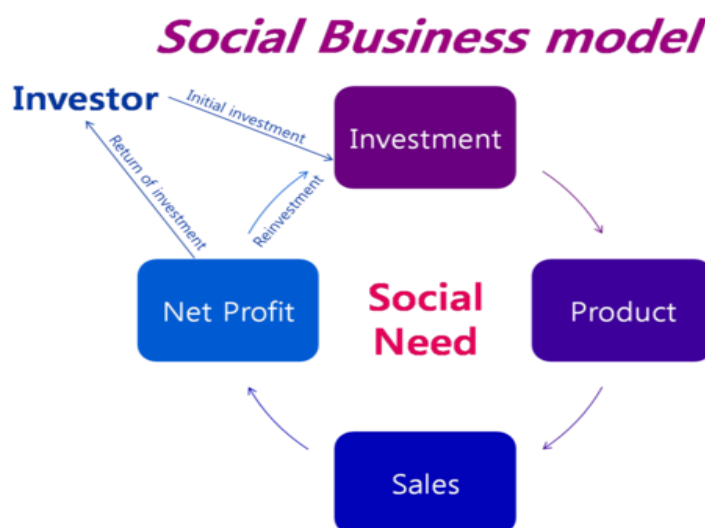
**Figure 2.2 The Business Model Canvas**

(Source <https://www.eship.ox.ac.uk/business-model-canvas-explained>)

A business model canvas will systematically reflect on the business model of the company. This enable to focus on our business model segment wise. Various points included can be seen in the above figure.

### Social Business Model Framework

A business model can be called a structure design or a framework that is followed by a business to bring value to its customers and clients. Based upon the above definition we can conclude that a social business model can be called a structure, design or a framework that a social business follows so that it can bring a positive change along with maintaining healthy financial returns.



**Figure 2.3 Social Business Model**

(Source [https://www.pngkey.com/detail/u2r5a9e6a9w7w7a9\\_professor-yunus-believes-such-projects-might-work-especially/](https://www.pngkey.com/detail/u2r5a9e6a9w7w7a9_professor-yunus-believes-such-projects-might-work-especially/))

## Social Impact Theory

Social impact theory states that amount of influence experienced by a person in a group setting depends upon the following factors

- Strength of the group
- Number of people in the group that exert social influence
- Immediacy of the group

This theory is different from the others as it focuses on strength and immediacy. A detailed analysis is presented below

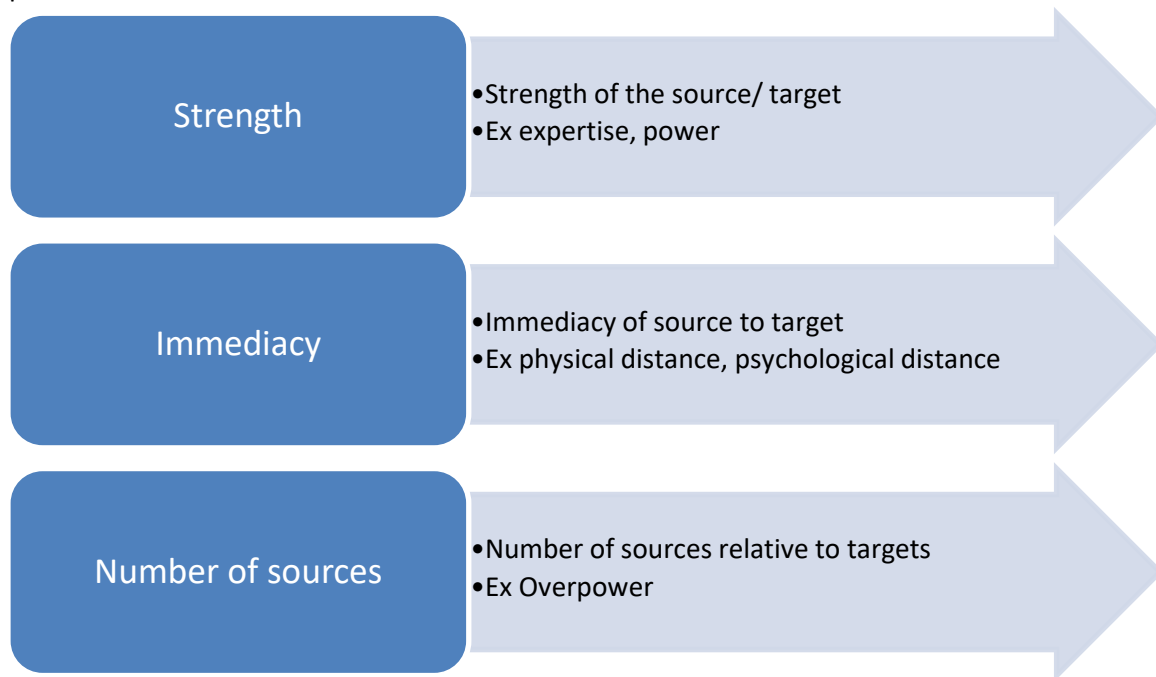


Figure 2.4 Social Impact Theory

A deeper understanding about sustainability is a must for every business. Social enterprises apply the solutions of the business problems to the social problems and try to find out solutions for the same. The utmost important factor for any business model is the value proposition. It is really very important that the products and services yield tangible and profitable results for the target customers of the company. A business model canvas will systematically reflect on the business model of the company. This enables to focus on our business model segment wise.

### To Do Activity

Take any social enterprise of your choice that is accessible to you. Prepare a social business model for that enterprise.

## 2.2 Financial Management

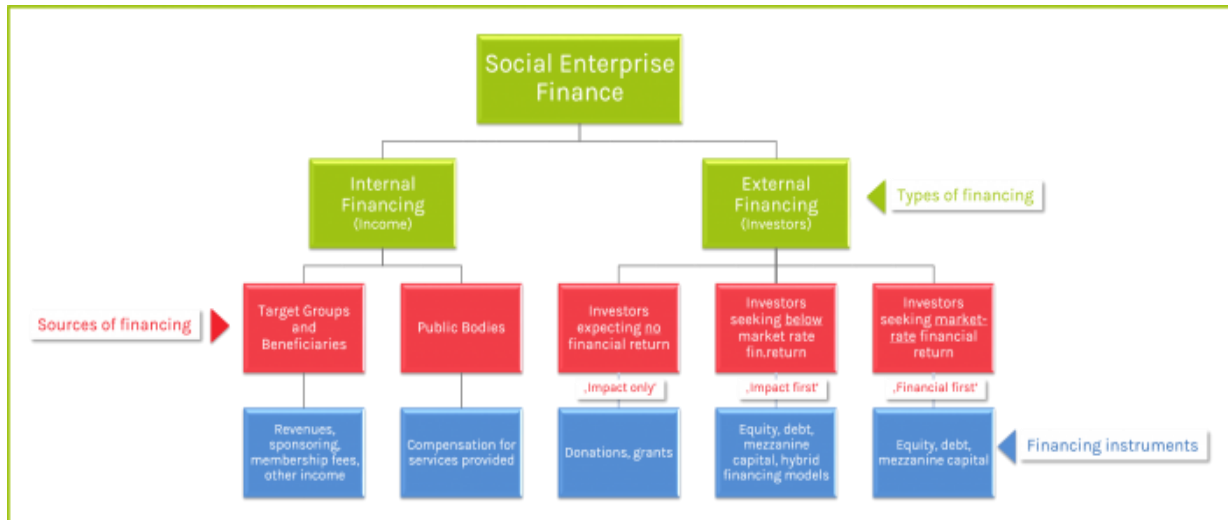
Financial Management is defined as “planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise.” In other words, it is the application of general management principles to the financial resources of the enterprise. Since the underlying objective of setting up a social enterprise is to effect social change and provide solutions to the complex social problems, the element of financial management becomes more crucial in case



of social entrepreneurship. This unit will highlight the various elements of financial management in a social enterprise.

### Finance Networking

“A financial network is a concept describing any collection of financial entities (such as traders, firms, banks and financial exchanges) and the links between them, ideally through direct transactions or the ability to mediate a transaction.” (Nagourney and Key, 2001)

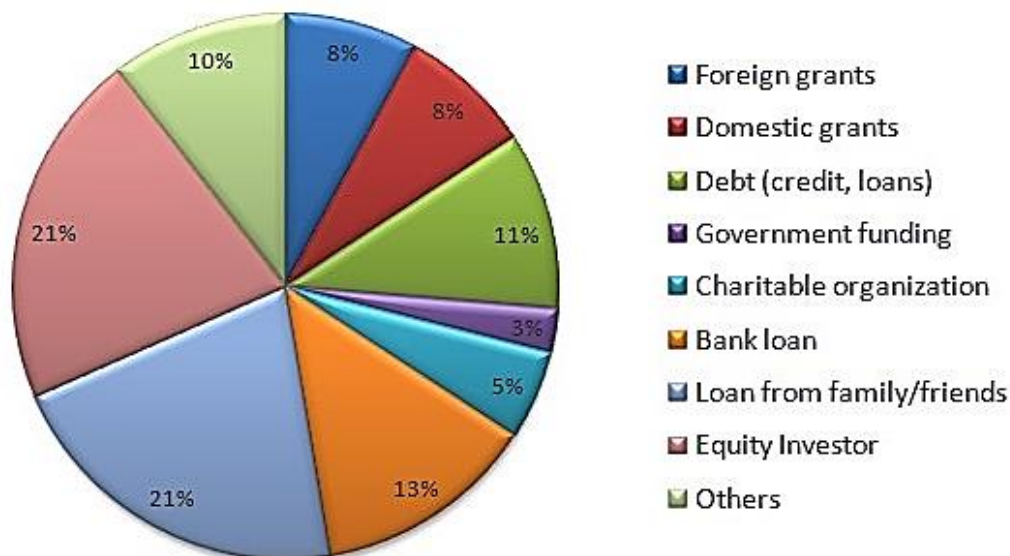


**Figure 2.5 Financial Management in Social Entrepreneurship**

(Source Christina Moehrle, Social Finance Academy, June 22, 2018)

### Sources of Funds

Because of the fact that the structure of social enterprises is distinct from a traditional business or charity enterprise, the sources of funds for these social entrepreneurs are also different. Broadly, their sources of funds may include investments, grants or a combination of both.



**Figure 2.6. Sources of Funding for Social Entrepreneurship**

(Source <https://indiamicrofinance.com/main-sources-funding-social-enterprise-india-social-business-survey.html>)

## How to Raise Capital as a Social Entrepreneur?

1. Detailed information (<https://www.youtube.com/watch?v=CWwVJsKMIEI>) on raising funds for social entrepreneurship



**Figure 2.7. How to Raise Funds for Social Entrepreneurship?**

(Source <https://www.pwc.nl/nl/assets/documents/pwc-social-enterprises.pdf>)

### Achieving Financial Stability

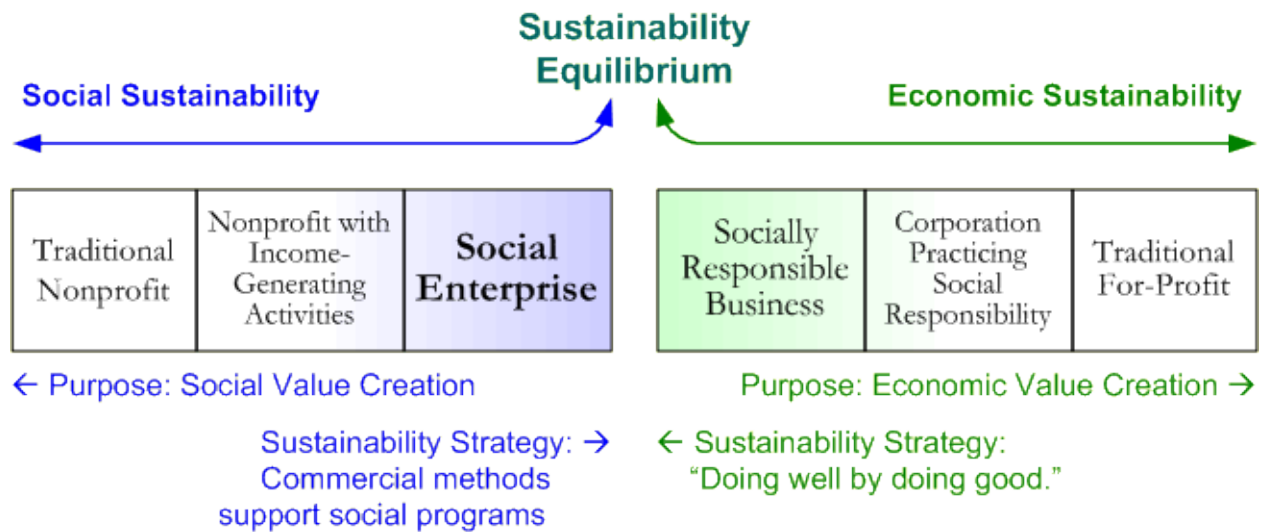
It has been observed that the traditional businesses achieve financial sustainability by either of the following.

- Growing their revenue.
- Improving their gross margins.
- Improving their operating margins.
- Increasing their free cash flow.
- Efficiently managing capital expenditures.
- Efficiently managing working capital.
- Building their asset base.

In contrast to the traditional business enterprises, social enterprises also aim at achieving the financial sustainability, except that they value social impact over profit. Also they use the profits for creating a social impact. This hybrid structure becomes the foundation for achieving the financial sustainability in social entrepreneurship. Here, in this case, the “income generating activities”, popularly termed as IGAs, contribute towards achievement of this objective of financial

sustainability. These IGAs reduce the dependence on the government agencies or other grant giving foundations (Shaughnessy, 2012).

### Building a Financial Sustainable Model



**Figure 2.8 Building a Financial Sustainable Business Model**

(Source <http://www.4lenses.org/setypology/print>)

Financial management is the application of general management principles to the financial resources of the enterprise. Since the underlying objective of setting up a social enterprise is to effect social change and provide solutions to the complex social problems, the element of financial management becomes more crucial in case of social entrepreneurship. A financial network is a concept describing any collection of financial entities (such as traders, firms, banks and financial exchanges) and the links between them, ideally through direct transactions or the ability to mediate a transaction. Because of the fact that the structure of social enterprises is distinct from a traditional business or charity enterprise, the sources of funds for these social entrepreneurs are also different. Broadly, their sources of funds may include investments, grants or a combination of both. In contrast to the traditional business enterprises, social enterprises also aim at achieving the financial sustainability, except that they value social impact over profit. Also they use the profits for creating a social impact. This hybrid structure becomes the foundation for achieving the financial sustainability in social entrepreneurship.

#### To Do Activity

Talk to any social entrepreneur accessible to you. Understand how they assessed their capital requirements at the time of starting their venture. Understand the various challenges that they face while raising capital for their venture. What was different alternatives and how did they make a decision? Write this into a half-page report.

### 2.3 Marketing and Human Resource Management

This section will throw light upon the basics of Social Marketing its Principles and various marketing strategies. The unit also describes the concept of Human Resource Management.

## Social Marketing

Social Marketing can be seen as an approach which is used to develop activities aimed at changing or maintaining people’s behavior for the benefit of individual as well as the society. Social marketing is a combination of commercial marketing and social science. Social marketing is helpful in influencing behavior in a cost effective and sustainable manner. Click here (<https://youtu.be/nf3FW1XhA6s>) for details.

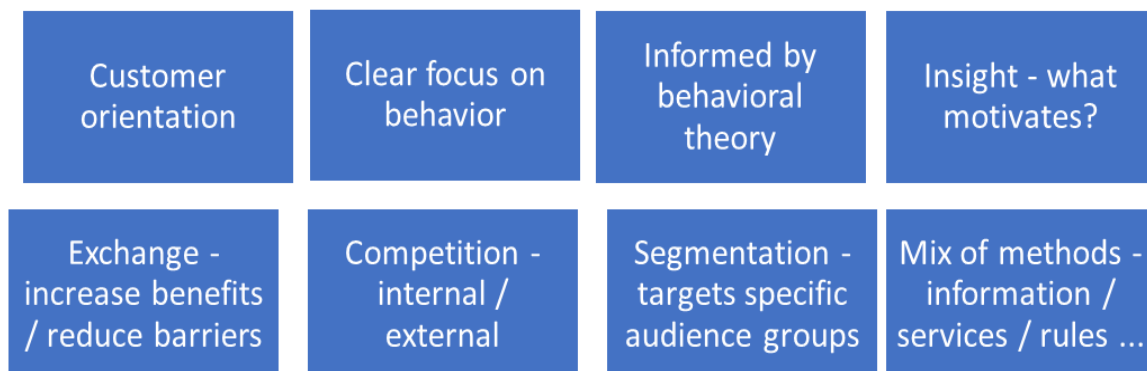


**Figure 2.9. Concept of Social Marketing**

(Source <https://richtopia.com/strategic-marketing/what-is-social-marketing-how-does-it-work>)

## Principles of Social Marketing

Social marketing uses commercial marketing principles and techniques to improve the welfare of people including the physical, social and economic environment in which they reside. Its actually a very planned and long-term approach to change human behavior. The following figure explains the 8 Benchmark criteria delineating how social marketing works.



**Figure 2.10 Principles of Social Marketing**

## Social Marketing Strategies

This strategy is actually a summary of everything we plan to do and what the company hopes to achieve. It provides a guideline for the company. The strategy must be developed in a proper and specific way so that it is effective and helpful in the company's profitability.



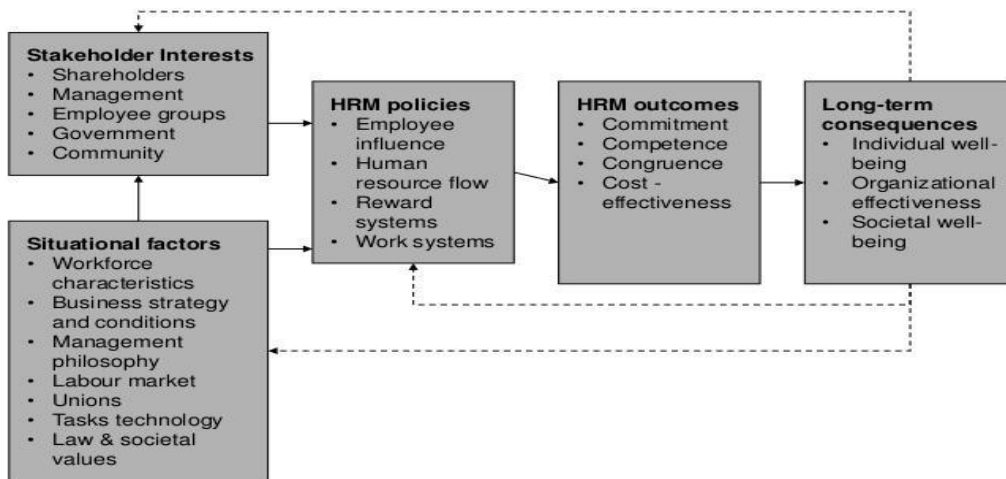
**Figure 2.11. Social Marketing Strategies**

(Source <https://www.slideshare.net/barenblat/viral-marketing-advertising-strategies-for-social-networks/14-Social-Marketing-Strategy-WHY-WHO>)

## Human Resource Management

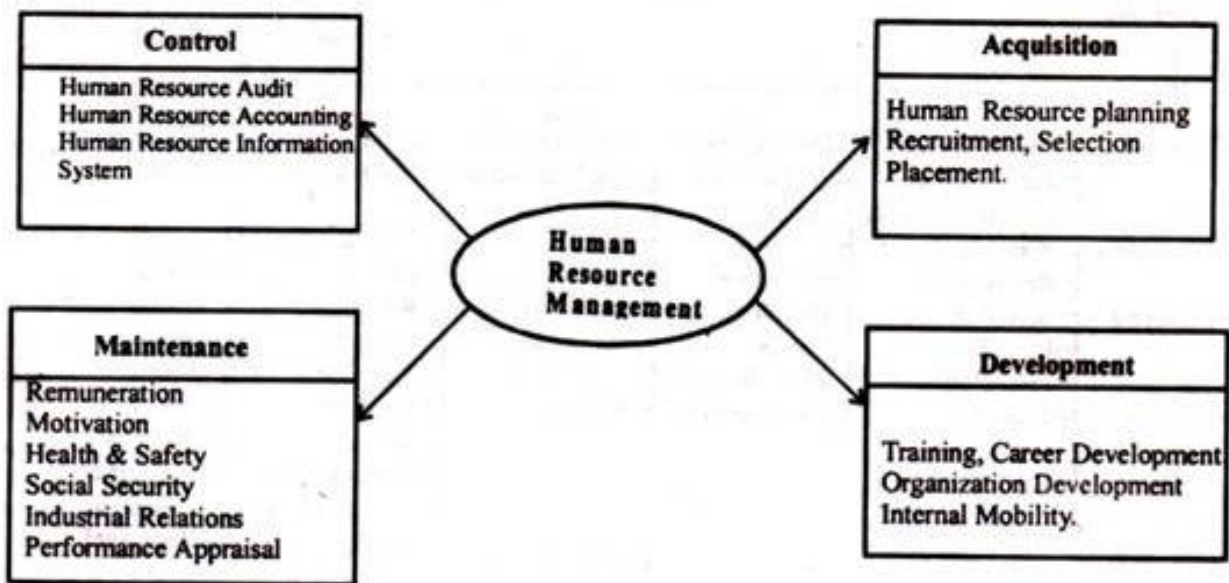
Human resource management, HRM, is the function of a business organization that aims to look after the hiring, management and firing of staff. HRM focuses on the function of people within the business, ensuring best work practices are in place at all times. It aims to ensure smooth running of the business and smooth functioning of the staff within the organization.

## THE HARVARD FRAMEWORK FOR HRM



**Figure 2.12. Human Resource Management Concept**

(Source <https://www.managementstudyhq.com/hrm-models.html>)

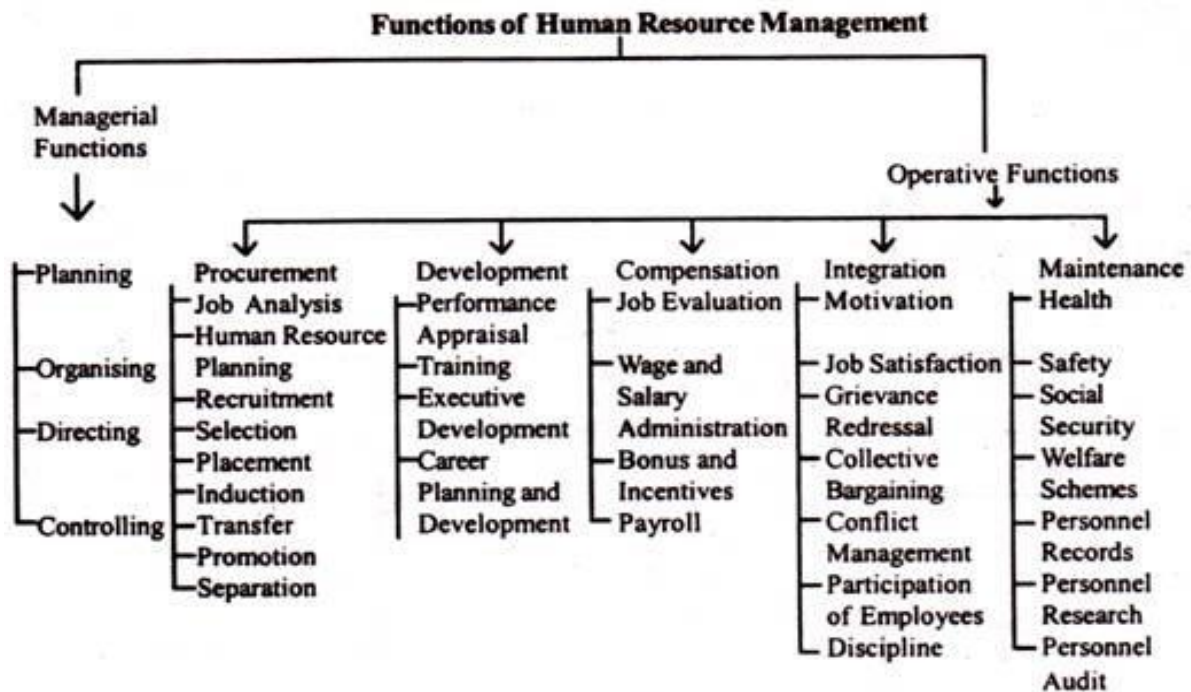


**Figure 2.13 Scope of Human Resource Management**

(Source <http://www.yourarticlelibrary.com/hrm/human-resource-management-meaning-objectives-scope-and-functions/35229>)

There are a whole lot of functions that HRM includes. They are





**Figure 2.14 Functions of Human Resource Management**

(Source <http://www.yourarticlelibrary.com/hrm/human-resource-management-meaning-objectives-scope-and-functions/35229>)

Social Marketing can be seen as an approach which is used to develop activities aimed at changing or maintaining people’s behavior for the benefit of individual as well as the society. Social marketing uses commercial marketing principles and techniques to improve the welfare of people including the physical, social and economic environment in which they reside. It is actually a very planned and long-term approach to change human behavior. The strategy must be developed in a proper and specific way so that it is effective and helpful in the company’s profitability. HRM focuses on the function of people within the business, ensuring best work practices are in place at all times. It aims to ensure smooth running of the business and smooth functioning of the staff within the organization.

**To Do Activity**

Identify up to 3 social entrepreneurial firms. Analyses their marketing strategies. Compare and contrast the pros and cons of each strategy. Write this into a half-page report.

**2.4 Performance Management**

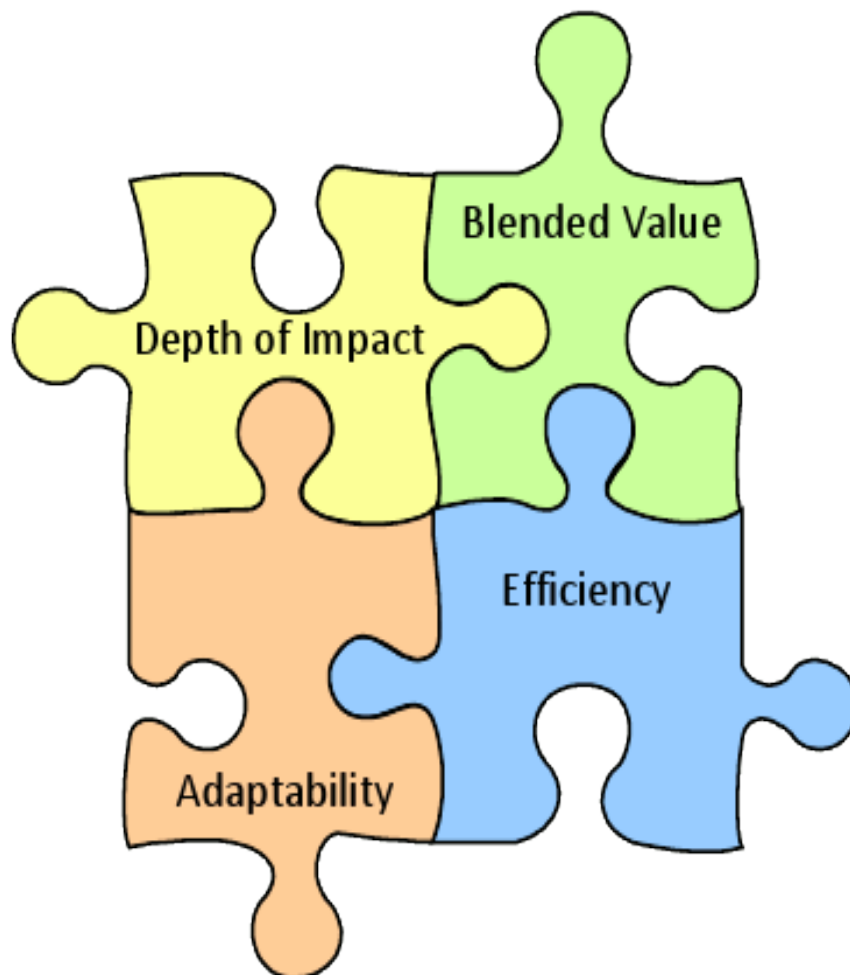
Performance management has gained a significant relevance in the present scenario. Since the social enterprises are primarily aimed at striving towards a social cause, the performance management becomes more crucial. From the perspective of a social entrepreneur, measuring the performance of a social enterprise is important because it helps in decision making and ensuring accountability towards various stakeholders. Due to a varied magnitude of impact of the social entrepreneurship, there are different ways that have emerged to measure this impact. This unit will focus on these methods that allow a social entrepreneur to measure the performance of the social enterprise.



## Defining Performance Criteria

The performance criteria are classified under four heads

- Depth of Impact. This criterion defines the effectiveness of the organization at addressing the fundamental causes of the social problem.
- Blended Value. This deals with the effectiveness of the organization at creating economic wealth and social value.
- Efficiency. This criterion relates to the effectiveness of the organization at systematically striving to generate a higher output with a lower input.
- Adaptability. This highlights the need for effectively adapting to the dynamic nature of environmental conditions.

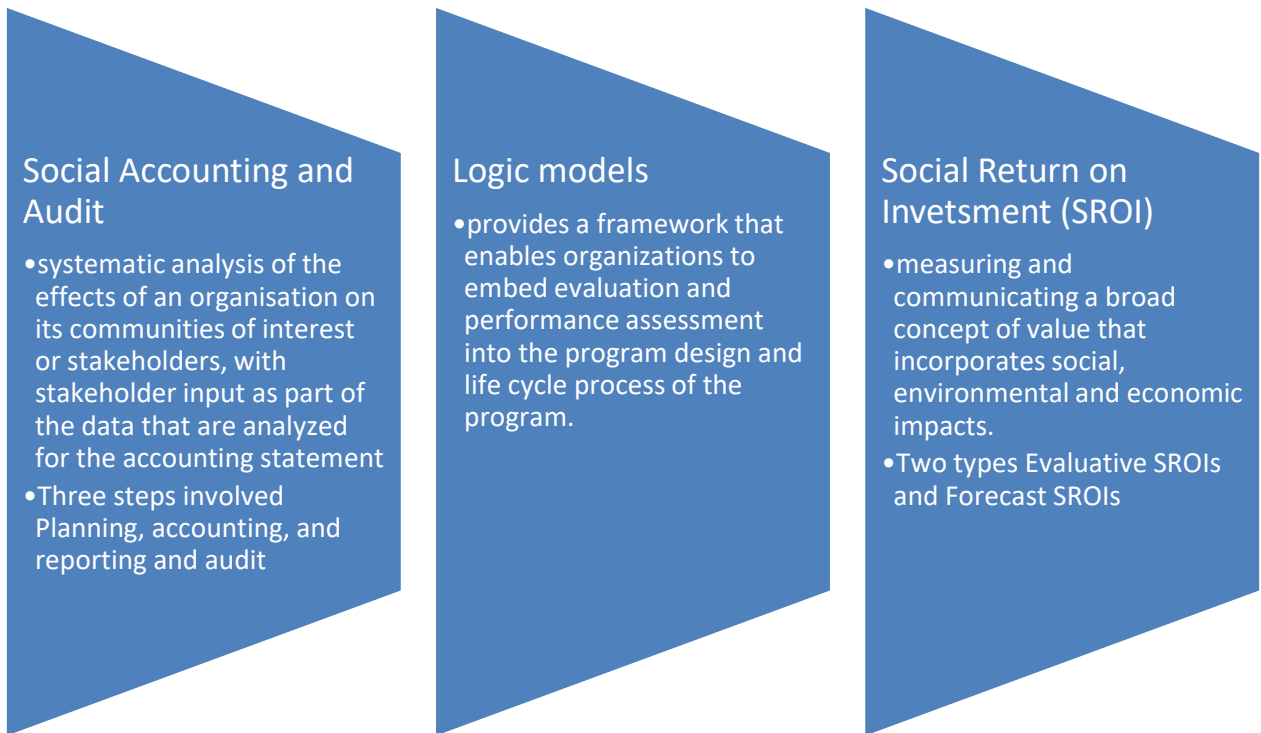


**Figure 2.15 Determining the Performance Criteria**

(Source [http://www.4lenses.org/part2/performance\\_criteria](http://www.4lenses.org/part2/performance_criteria))

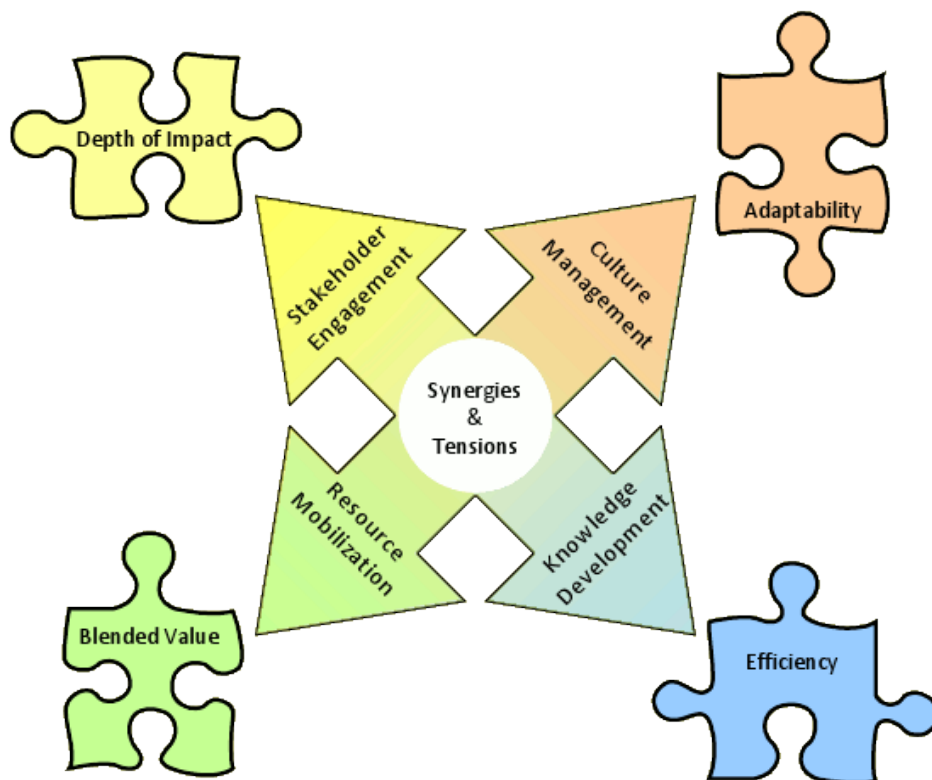
## Tools for Measuring Impact

The various tools that can be used to measure the impact of social enterprise are as follows.



**Figure 2.16 Tools for Measuring Impact of a Social Entrepreneurship**

The following figure illustrates the linkages between the different performance criteria and the underlying synergies in the organization.



**Figure 2.17 linkages between the Different Performance criteria and the underlying Synergies**  
 (Source [http://www.4lenses.org/part2/performance\\_criteria](http://www.4lenses.org/part2/performance_criteria))



## Goonj: The Circular Social Innovation Paradigm



**Figure 2.20 Successful Initiatives - GOONJ**

(Source [https://ssir.org/articles/entry/circular\\_social\\_innovation\\_in\\_india](https://ssir.org/articles/entry/circular_social_innovation_in_india))

From the perspective of a social entrepreneur, measuring the performance of a social enterprise is important because it helps in decision making and ensuring accountability towards various stakeholders. Due to a varied magnitude of impact of the social entrepreneurship, there are different ways that have emerged to measure this impact. The unit discusses the various tools for measuring this impact vis-à-vis social accounting and audit, logic models, social return on investment, followed by real business cases.

### To Do Activity

Take any 3 social entrepreneurship ventures. Prepare a comparative statement for these 5 firms measuring their impact as a tool of performance measurement.

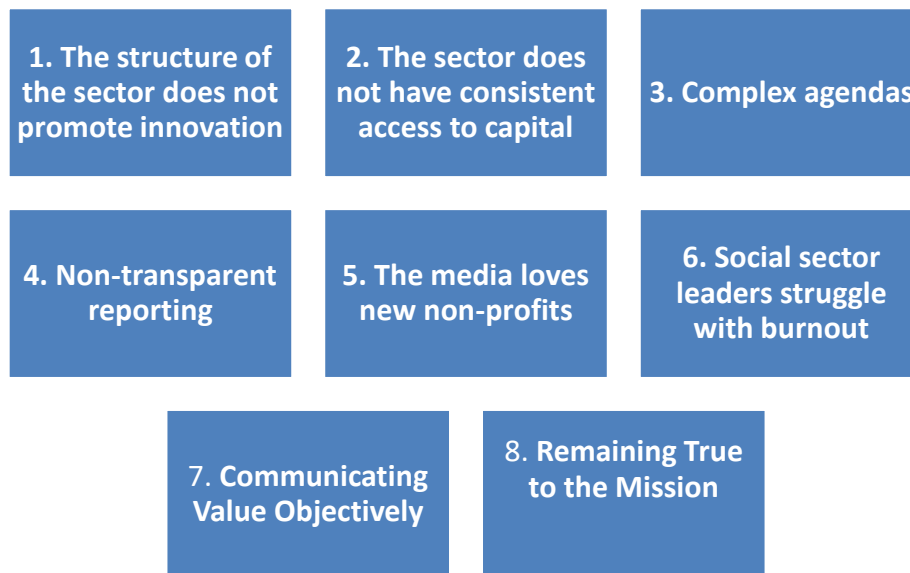
## 2.5 The Future Challenges Ahead

Social entrepreneurs are increasing in response to the devastating social and environmental challenges that are being faced by the society. Though social entrepreneurs have a dominant influence on our society today, they are slowly redefining everything about an enterprise. But the fundamental question is, "are social entrepreneurs the future of enterprise?" This unit addresses this question and discusses the challenges for the social entrepreneurs and the path ahead for attaining the goals.

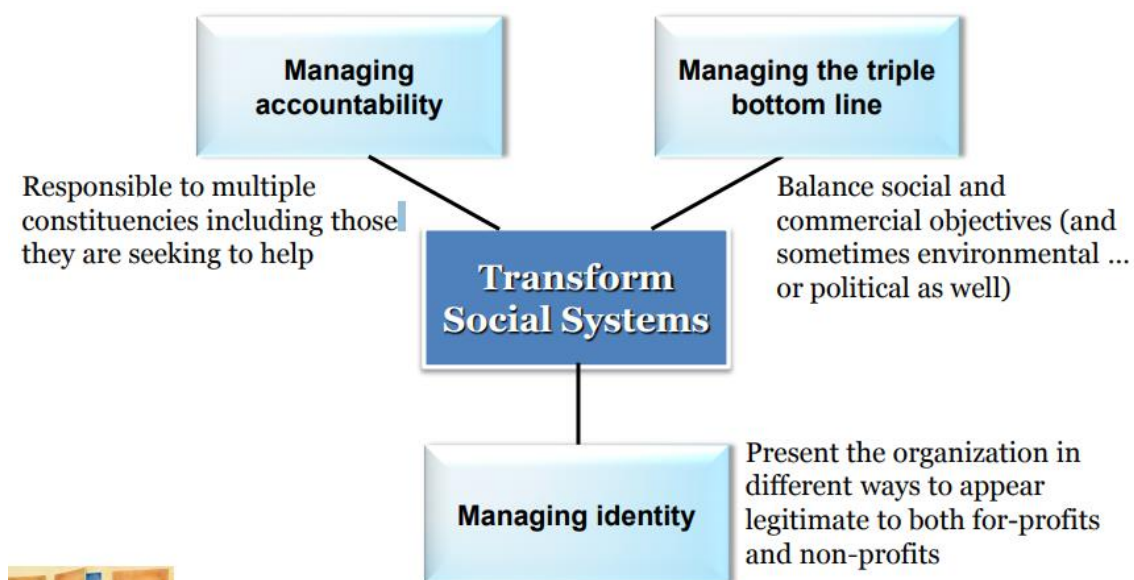
### Challenges for Social Entrepreneurs

India is one of the world's most populous nations, and despite India's influence on the global economy and innovation sector, India's public and private sectors continue working on challenges to bringing the nation's almost 180 million residents currently under the poverty line to a healthy and

safe way of life. The on-the-ground realities of running a social venture remain daunting. The key challenges that the social entrepreneurs are facing are described below.



**Figure 2.21. Challenges for Social Entrepreneurs**



**Figure 2.22. Social Challenges for Social Entrepreneurs**

(Source

<https://www.albany.edu/faculty/miesing/teaching/socent/9%20The%20Future%20of%20Social%20Entrepreneurship.pdf>)

### Paths to Social Entrepreneurship

Social entrepreneurs, often referred as the, “Agents of Change” are committed to formulate innovative solutions for the most pressing problems in the world. These problems can be broadly classified into the areas related to education, health-care, environment and livelihood opportunities. Ashoka, 2012 explains the five predictions for the future of social entrepreneurship. These predictions primarily focus on.



**Figure 2.23 Five Predictions for Future Social Entrepreneurship**

(Source Ashoka, 2012)

With its diverse and complex socio-cultural environment, high economic inequality between urban and rural areas, and low human development index, India definitely demands skillful navigation of its unique challenges. But in challenges lie opportunities focused government policies, quickly rising investor interest, and a raw entrepreneurial energy waiting to be unleashed has positioned India to take these challenges head-on.

**To Do Activity**

Search on the internet or in other sources and identify one successful social entrepreneur. Write down a one-page report that captures the success story and also discuss what you would have done differently if you were in his or her place.

**Model Questions**

1. What do you mean by business model? What role does it play in a social venture?
2. Discuss in detail the social impact theory.
3. What is financial management? How is the financial management different for a business enterprise and a social enterprise?
4. Throw light on the social marketing strategies with reference to the Indian context.
5. Explain in detail the various tools that can be employed for measuring impact of social entrepreneurship.
6. Critically evaluate the current scenario for social entrepreneurs.

## Suggested Readings

1. 10 social entrepreneurs in India who are changing the country for the better (can be retrieved from <https://in.thehackerstreet.com/social-entrepreneurs-2/>).
2. 4 Reasons Your Team May Be Overwhelmed by Social Marketing – John Rampton, Forbes, 2018.
3. Business Model Canvas A Simple Tool for Designing Innovative Business Models – Ted Greenwald, Forbes, 2012
4. Five keys to success for social entrepreneurs (can be retrieved from <https://www.youtube.com/watch?v=Pl8c5ooHfWs>).
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# Chapter 3 Civil Society and NGO – A Glimpse

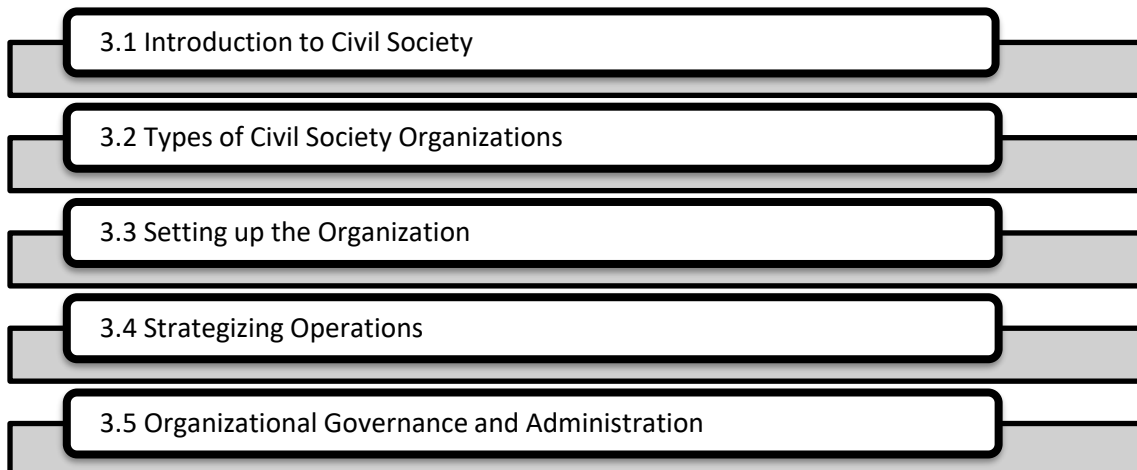
## Introduction

Non-governmental organizations are essentially nonprofit organizations in which people with similar interests come together to work at the ground level. They are generally driven by humanitarian motives and aim to bring change in society. They monitor policies and provide advice using their expertise in the domain. They often pressurize government for better performance and serve as warning mechanism in many cases (ngo.org, n.d.)

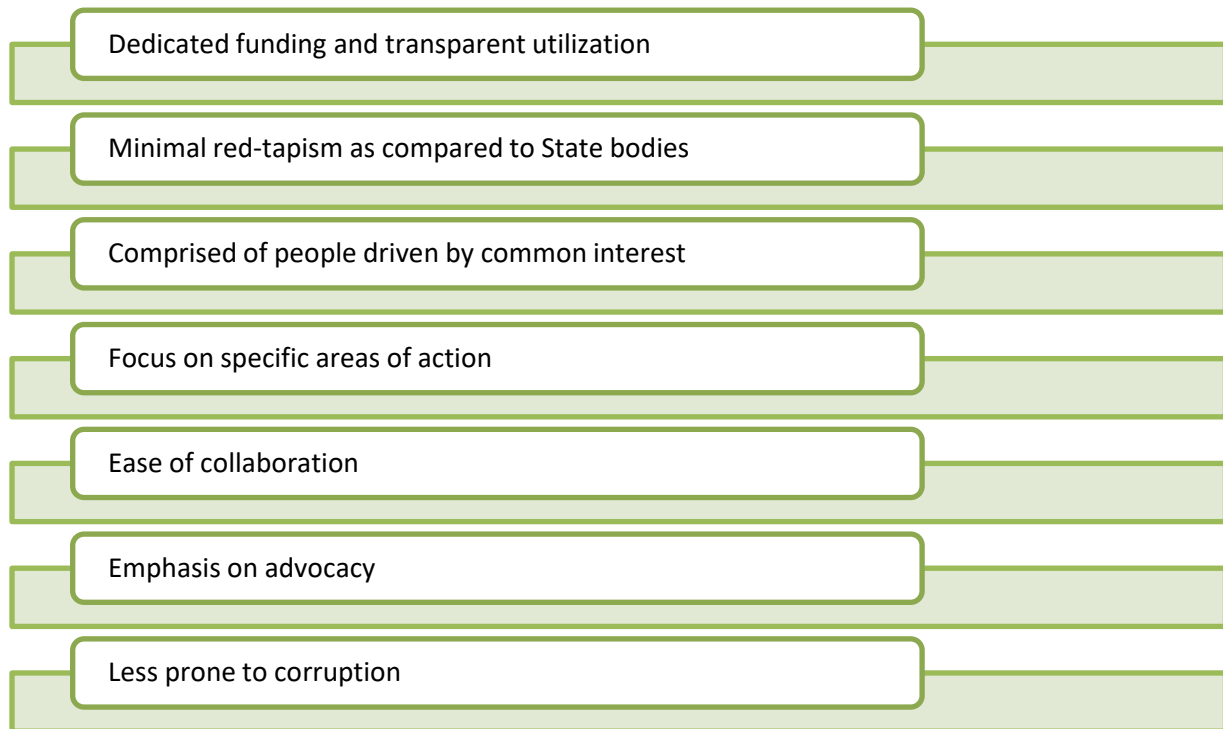
## Objectives

- To gain a basic idea about the purpose and significance of not-for-profit NGOs in the current world.
- To gain a basic idea about the major types of CSOs functioning in society today.
- To internalize how to go about the process of setting up an NGO, given the prevailing norms in society.
- To discuss and familiarize with the processes involved in planning to set up operations while initiating an NGO.
- To acquaint with the processes involved in conception of governance protocols and office administration in an NGO.

## Structure



Due to the following reasons they are believed to be the only carrier for fruition of MDGs



### Advantages of Civil Societies

#### 3.1 Introduction to Civil Society

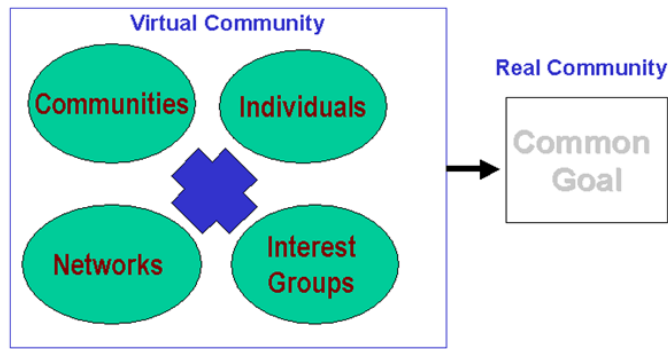
Civil society organizations have been increasingly incorporating tasks formerly carried out by state administrative bodies. Cross border campaigns for different violations like labor, human rights and environment have increased along with formulation of development policies.(The University of Melbourne, 2019). The purpose of these revolutions has not been clear as to if they lead to decentralized and active government or show the advent of capitalism in the public domain. (The University of Melbourne, 2019).

#### Global Responsibility Paired with Advocacy

In a globalized ecosystem, where “economies, political systems, information technologies and development opportunities interact, and where threats, conflicts and world proportions challenge, Global Responsibility Global Solidarity promotes civic humanism as a world alternative, based on the dignity of the human person and their responsible and free projection into the communities where political, economic and social life takes place.” (Global Responsibility, 2012).

“Advocacy works primarily to change the behavior of public leaders or decision-makers. Communication generally targets individuals and small groups. Social mobilization aims to secure community-based support.” (NCBI, 2008) Digital Governance as well as lay public models that utilize e-advocacy and mobilization mainly through social media and other mass media has been on the rise for the past decade. These have been proving to be much effective in reaching a large population within a short time and thereby creating a significantly stronger impact.

### Networking for Concerted Action



**Figure 3.2 - E-Advocacy Model**

Source The Digital Governance Initiative – E-Advocacy Model

Two milestones in the timeline of NGOs can be said to be the declarations of Millennium Development Goals (2000), and Sustainable Development Goals (2015) by the United Nations Organization. This eventually gave rise to the “NGO revolution” as some scholars call it, which essentially was a boom in the number as well as impact of not-for-profit NGOs operating across the world. The very fact that these private entities are not constrained by the immense administrative intricacies and formalities associated with State bodies by itself serves to prove the potential of such organizations in helping to build a better working world.

### Millennium Development Goals (MDGs)

The United Nations Millennium Development Goals were eight goals that all 191 UN member states had agreed to try to achieve by the year 2015. The Millennium declaration signed by the United Nations in 2000 commits that leaders from across the world will come together to fight the evils of illiteracy, diseases, poverty, hunger, environmental damage and bias against women. Eight MDGs stated below are a result of the millennium declaration.



**Figure 3.3 - Millennium Development Goals**

Source Outline of the Millennium Development Goals notable challenges

The MDGs are affected by each other and are dependent on each other. All the MDGs make an impact on health and similarly health also makes an impact on all of them. For example, better health enables faster learning in children and increased productivity and earning capacities of adults. Gender equality is important for achievement of good health among females. Good health helps in reducing poverty and overcome the problem of hunger. Reduction in environmental degradation also leads to better health. (World Health Organization, 2019).

Here is a video on the accomplishments of MDGs<<https://www.youtube.com/watch?v=A5giOGij5X8>>.

### Sustainable Development Goals

The Sustainable Development Goals are a collection of 17 global goals set by the United Nations General Assembly in 2015. (United Nations Organization, 2015).

Actions must be taken to end poverty and establish peace and prosperity. The call for the action is the sustainable development goal (SDG) or global goal.



**Figure 3.4 - Sustainable Development Goals**

Source [SUSTAINABLE DEVELOPMENT GOALS | UNDP](#)

“These Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.” (UNDP, 2019).

Here is a video commenting on India and the UNs SDGs.  
<<https://www.youtube.com/watch?v=Bh6SrEQSPOI>>.

In this Unit we looked at the concept of the NGOs and considered the role of NGOs in development. From the development perspective, we also looked at the Millennium Development Goals and the Sustainable Development Goals from the United Nations.

#### **To Do Activity**

What are civil societies? Based on your study of the course explain the various types of civil societies and their working in the present context. Study the working of UNICEF and the role of civil societies with respect to it.

### **3.2 Types of Civil Society Organizations**

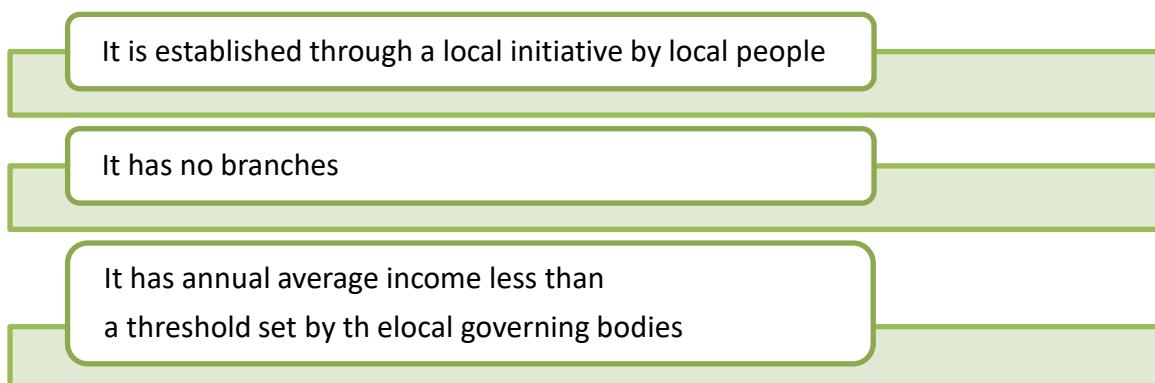
“Civil society organizations (CSOs) can provide both immediate relief and longer-term transformative change – by defending collective interests and increasing accountability; providing solidarity mechanisms and promoting participation; influencing decision making; directly engaging in service delivery; and challenging prejudice. In this way, excluded groups can be effective drivers of their own change by forming or participating in organizations that represent group interests. CSOs also play an important role in conducting research to raise the profile of excluded groups.” (Khan, Combaz, & McAslan Fraser, 2019).

#### **Social Movement**

Social movements are essentially meant to hold up the citizens’ active roles and to make the state to account for its obligations to the society. When voluntary parties of citizens organise themselves in the best interest of some public cause, it is a social movement; and when they take form of an organization for the same, it is a social movement NGO.

#### **Grassroots Association**

A grassroots civil society association refers to a group of self-organized individuals coming together to pursue interest common to them in volunteer-based model. The organization is a non –profit one. (Civil Society Dialogue, 2017).



**Fig 3.5 Grassroots Civil Society**

## Social Enterprise

The social enterprise work on the ideology of operating a business that contributes positively towards social or environmental causes and believes in investing the profits into causes which helps in promoting the original ideology. (UK Civil Society Almanac, 2014) It applies commercial strategies in order to maximize financial, social and environmental benefit, thereby maximizing social impact along with business returns for external shareholders.

## Development NGO

An aid intermediary, which is both non-profit and non-governmental in nature, which provides proper flow of funds from the donor to the recipients in the developing or underdeveloped countries. (Aldashev & Navarra, 2015).

In this Unit we have seen the various types of civil society organizations. From the definitions, we find that each of these forms of organizations serves a different purpose.

### To Do Activity

You are working with a company who wishes to set up an NGO for ensuring education for girls. What are the essential points of consideration that should be taken care of? If you are to lead the project draft a proposal including all relevant details.

## 3.3 Setting up the Organization

This Section will discuss the process followed for setting up an organization. This will also highlight the importance of different authorities and their respective roles in facilitating the setting up an organization.

### Constituting Board of Governors

The board in an NGO may be called by different names like 'Board of Directors; 'Advisory Group', 'Steering Committee' etc.

### Functions

- The primary function is to come up with strategies and plans that is in line with the original purpose and vision of the NGO.
- Set up plans and guidelines for various activities like operations, management etc. along with budget allocation.
- It also helps in appointment of members and setting up criteria of membership for review panels and also for support groups.
- It also works extensively on monitoring and evaluation of performance by defining a framework for the same so that they can be carried out independently.
- It takes the views and ideas of NGO to a bigger stage by actively giving chance to represent in larger scale outside the NGO.
- It also helps in active mobilization of the resources and coordination with agencies outside the NGO ecosystem.



The board members are generally well-respected people in the society and can influence the key decision makers to listen to the voices of the affected people. Moreover, they are the first contact for anyone outside the NGOs. Many a times they could be the first checkpoint for hearing the voices of the affected people.

### **Selection and Terms of Engagement**

The following criteria are generally kept in mind while selecting the board members

- It is very important that the board members can add value to NGOs present set up in understanding and solving issues related to NGO.
- They should have previous experience as board members in similar kind of workspace.
- They should very well understand the domain in which the NGO operates and have a clarity on the opportunities and experience it represents.
- Apart from having an experience in the similar role, as already mentioned, they should have ground level experience of community work.
- Communication and networking are two other criteria that should be looked upon during the selection of an individual.
- They should be gender neutral and have good communication and networking skills
- A good team player with good political skills along good contacts with consulting and support groups is always welcome into the system.
- They should be able to promote the vision of the NGO outside the NGO effectively.

### **Composition of Board**

12-15 members including a treasurer, a president and various different task or job specific positions required in the area where NGO operates. Rotation of positions take place along with renewal of term in lieu of good performance.

### **Length of Terms**

It varies from one organization to other. It is usually between a time periods of one to three years

### **Cessation of Appointment**

There could be various reasons for cessation of appointment. Some of them are listed below

- Resignation by the board member is one of the most common reason
- He/she is not able to devote the time committed at the beginning of the tenure
- He/she is not able to undertake the responsibilities agreed upon
- He/she now has no active relation with the organization that helped in nomination or selection of the member at first place
- He/she is not a team player and is not able to work with one or many other members of the board
- He/she has developed a conflict of interest

### **Mandate and Working Methods**

The board members have a very high attendance and generally do not miss any meetings. They can use various digital communication tools for connecting with the other stakeholders in case are they are not able to attend meetings due to their hectic schedule or travels. Board members motivate that representatives from different communities come together to shape the overall policies and

direction of the NGO by discussing about implantation, monitoring and evaluation of different programs and policies of the NGO.

They make sure that the resources are allocated appropriately and more attention is paid to the issues which are important to the NGO and the community. They also take inputs from local communities and share it with broader and global communities across the globe.

### **Setting up By-Laws**

These are internal documents which signify rules and regulations that govern the conduct of affairs in an organization. These documents should be clear and precise so that it is well understood by the members of the organization and other stakeholders involved. It is very often used for the registration process with different local and national authorities.

The bye-laws consists of the following

- Name and objectives
- Frequency of the meetings
- Voting rights
- Criteria of membership
- Book of accounts maintenance
- Rules and regulations keeping in mind the different amendments

### **Framing General Approach to Issues to be Addressed**

The MIT guide to NGOs provides the following approach to problem solving (Source <http://web.mit.edu/is/NGOManagement.pdf>)

“When an NGO approaches solving a problem, they can pursue the following structure

Gather information on the issue

- What is causing the problem?
- Who are the persons/organizations/department/ entity responsible?
- What are the consequences going to be? Assess magnitude, quality and prevalence.
- What are the alternatives/possible solutions?
- How much would they cost? Is it better to invest the money in other projects?
- Talk to people in the community for a holistic perspective.
- Talk to people who are in-charge and hear their side of the issue.
- You may be able to work towards solving problems together (co-operation, co-ordination).
- Request older, influential or respected people in the community to address public gatherings.
- Use the mass media to generate interest, communicate the facts and discuss options.
- Write polite, succinct articles for magazines and newspapers identifying the issues.
- Include people from diverse backgrounds, so that your organization is not portrayed to be linked with any particular political party or religious sect, etc.
- For fundraising purposes, let people know why funds are needed and how they will be used. Transparent and detailed accounts are imperative to build trust.
- Link up with other NGOs to maximize the effect of the effort.” (Mostashari, June 2005).

In this section, we have understood how NGOs are established, how they are governed, and how they function. We also looked into the contents of the by-laws.

#### **To Do Activity**

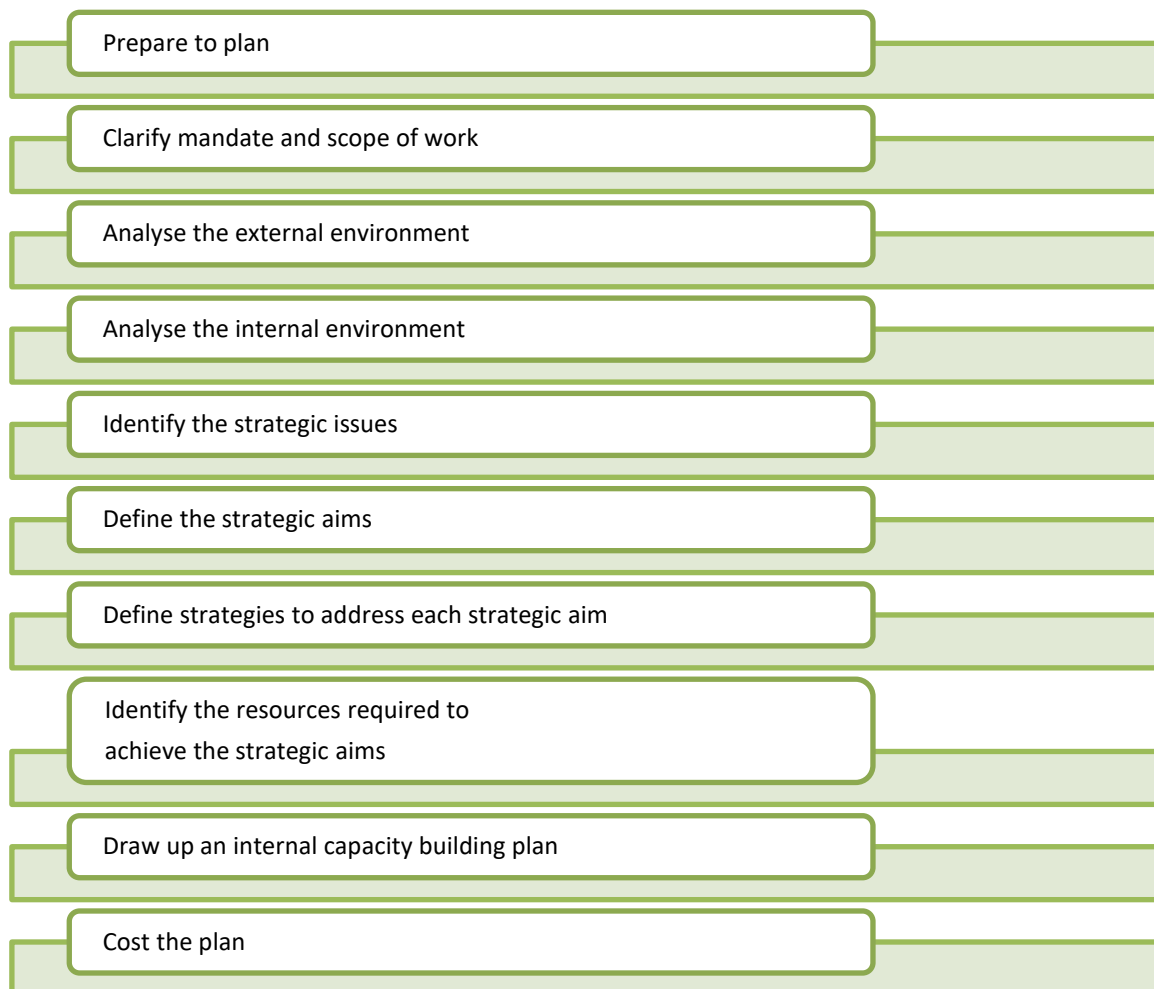
Take any two NGO's of your choice. Study their strategies and working. Analyses and compare their strategies and justify the analysis with examples and points.

### **3.5 Strategizing Operations**

This section will introduce you to the process of formulating strategies for an organization. It describes the key procedures as well as strategic insights for developing plans for the organization.

#### **Operations Planning**

A strategically crafted plan of operations is a vital tool to channel the work of any organization in an efficient manner. It helps maintain a focused and long-term emphasis on the organization's mission and vision, that would in turn supplement the decision-making process regarding allocation of resources. Let's take a look at how to get started with developing a strategic plan, on the basis of a shared vision of the future.



**Fig 3.6 Operations Planning**

Source (Progressio, 2016)

### Organizational Vision

The organizational vision serves as a tool in motivating individuals to achieve organizational goals and hence a lot of care must be taken while defining it. The vision is specific to a particular organization and should be re-examined from time to time during strategic planning process. The results of the re-examination will serve as a feeder material for strategic planning.

### Strategic Planning

Strategic planning is a set of systematic procedures to assist in making key decisions and concurring on actionable particulars that would in turn mould an organization in terms of its mission (how), and vision (why). The pros of formulating a strategic plan together as a team are many, such as Picturize and project clearly about the purpose and direction of the organization's work; craft it out into a document against which members of the organization can monitor progress, learn and improvise to maximize impact. Bolster team spirit by kindling a sense of belongingness in forging a clear mission ahead, together as a team. Formulate action plans in collaboration with partners, beneficiaries and other associated entities. Carefully plan resource utilization so as to ensure maximum exploitation of available resources.

### Structure of a Strategic Plan

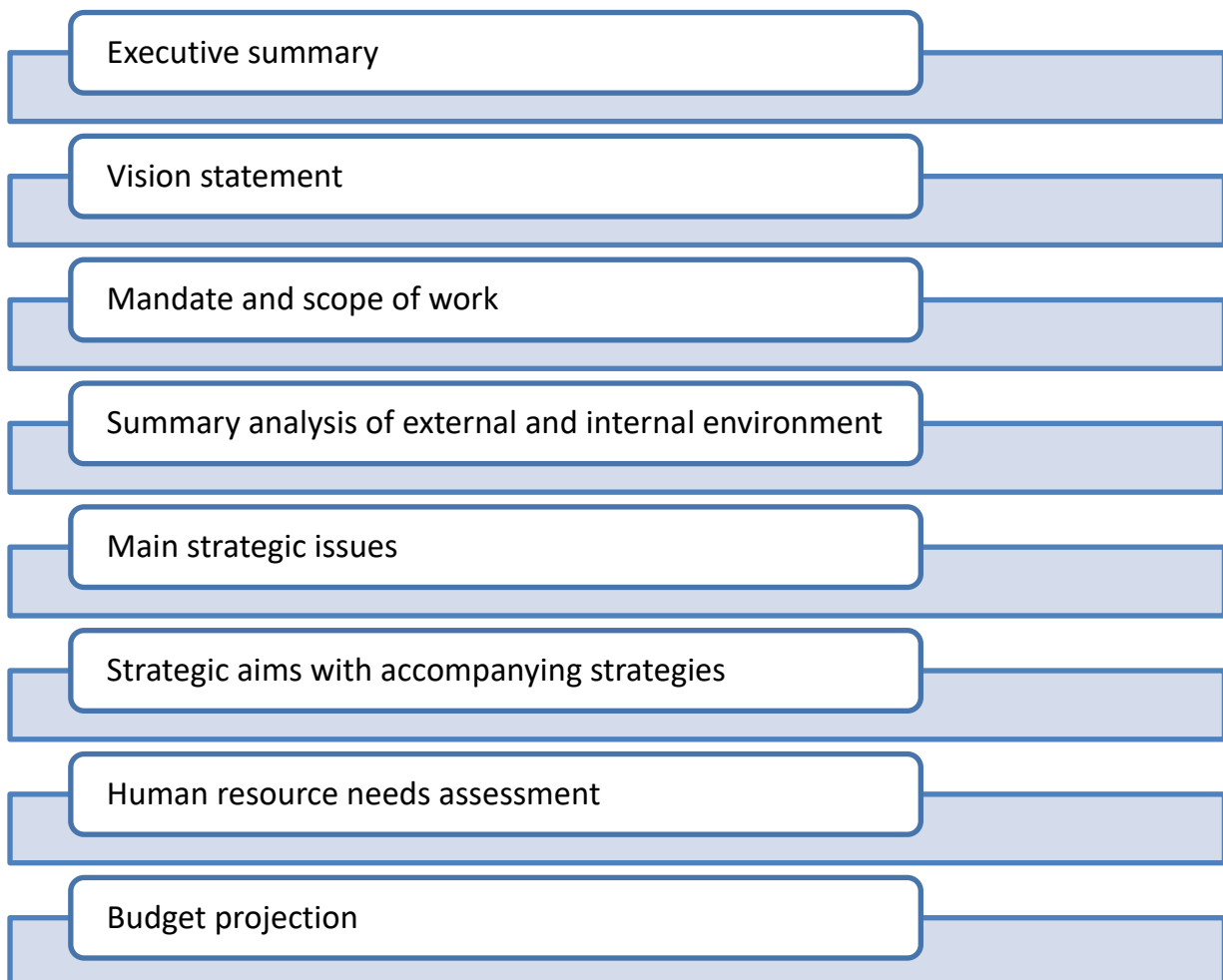


Fig 3.7 Strategic Plan

### Capacity-Building

Capacity building is a series of processes that enables an organization to boost its effectiveness and thereby impact in the society. This is meant help it achieve its objectives in a sustainable manner.



**Fig 3.8 Capacity Building**

Source (Progressio, 2016)

### Development Definition and Approach

While NGOs differ from each other in multiple ways, their definition of ‘development’ often takes the top position when it comes to the most pertinent factors of difference. This more or less unique perspective they hold would reflect in all arenas of their operation, including stakeholders such as beneficiaries, partner entities, and funding agencies. (Progressio, 2016).

### Environmental Dynamics

Source (Mustaghis-ur-Rahman, 2007).

### Political Environment

The political environment in which an organization operates influences it in various ways. For instance, if the political or other ideology followed by the incumbent governing body isn’t aligned well with that of the organization, this could mean trouble with operations in that particular state. The scope of their work could be limited to a minute portion, or even denied the regulatory framework clearance to operate altogether. Hence, it is imperative that an NGO be conscious of the politico-legal environment of the target country while formulating their proposal documents as well as the mission-vision statements.

### **Socio-Cultural Environment**

The values, norms, lifestyle, historical perspectives, traditions, social ideologies, beliefs, etc. of a society are reflected in their socio-cultural environment. It's imperative that an NGO should constantly be in contact with and sensitive to this environment and respect the socio-cultural sentiments and other more tangible elements of their society in order to gain acceptance to work in the social community.

### **Economic Environment**

The economic environment of a society directly influences the operations of an NGO. This is particularly visible in closed economies such as the Russian Federation and the People's Republic of China where the social ideology mandates that the provision of basic necessities as well as social progress to be the sole responsibility of the State. In such (politico-)economic environments, the rooting of a social cause NGO will be next to impossible as it doesn't suit the society's established social ideologies. It would be helpful to the NGO to frame its vision and mission in alliance with the larger economic environment prevailing in the country, to which the target community(ies) subscribe.

### **Technological Environment**

The technological environment prevalent in a society targeted by an NGO should be a prominent concern while framing its vision, mission, and strategies. It has to be in congruence with the level of technology common and familiar to the target community(ies), failing which there are high chances the people might reject the advances of the NGO. Although this has a high chance of occurrence, the inverse could also happen, depending on the specific historical social perspectives and social ideologies held by the people.

### **Collaboration with Other NGOs**

An NGO always have to remain in dynamic touch with the environment as well as all the players in it. Collaborations with other NGOs along with other entities bolsters its reach and enables it to focus on its area of expertise.

### **Stakeholders**

NGOs are generally heavily dependent on its stakeholders owing to the simple fact that their entire work is for, with, and most times by the stake holders themselves. This brings in the question who these stakeholders are. They are the beneficiaries and benefactors of the NGO, regulatory and administrative bodies, and the members of the NGO (thereby the NGO itself).

The beneficiaries of an NGO are also its active contributing partners, wherein they play a crucial role in how the NGO's work is shaped. It is standard practice among most NGOs to have representation of beneficiaries from their projects on the board as honorary members, thereby including them in the decision-making process. This aspect of positive ownership with the NGO could result in these community representatives inducing a constructive influence over the project activities. This in turn could result in two obvious benefits.

since the community representatives who are part of the board belong to the grassroots operations level, a feedback system would be initiated from the project base to the NGO executive level – this would prove to be extremely handy, probably even pivotal to the operational success of the NGO due to community-participation in governance, transparency at all levels of operations in the organization can be ensured.

Success in terms of an NGO would mean that the funds allocated for a project they undertake has been efficiently utilized to serve the purpose mutually defined between the donor and itself. Donors are concerned with financial transparency for obvious reasons, and expect the recipient NGO to maintain a good working relationship with them and also follow principles of fairness mutually agreed upon in the associative tie-up.

The work of an NGO is that of a supplementary nature to that of the State. Since social-economic development is in principle the portfolio of the State administration, it has the authority to audit the work being carried out by an NGO. That being said, the NGOs are generally a store house of rare grassroots level information that is valuable to the State in its day to day functioning. Hence, it is expected from NGOs to provide the State and its bodies with informed advice and information as and when required.

Sustainability is probably the single most significant trait of an NGO that enables it to attain its goals and remain operational.(Mustaghis-ur-Rahman, 2007).

In this section, we looked at how capacity building milestones could be achieved while setting up an NGO.

#### **To Do Activity**

Governing and administration of NGO is a very typical and difficult task. Explain why the governance of NGO's become so difficult even though so much support and grant is available. What can be done to channelize the efforts in positive direction.

### **3.5 Organizational Governance and Administration**

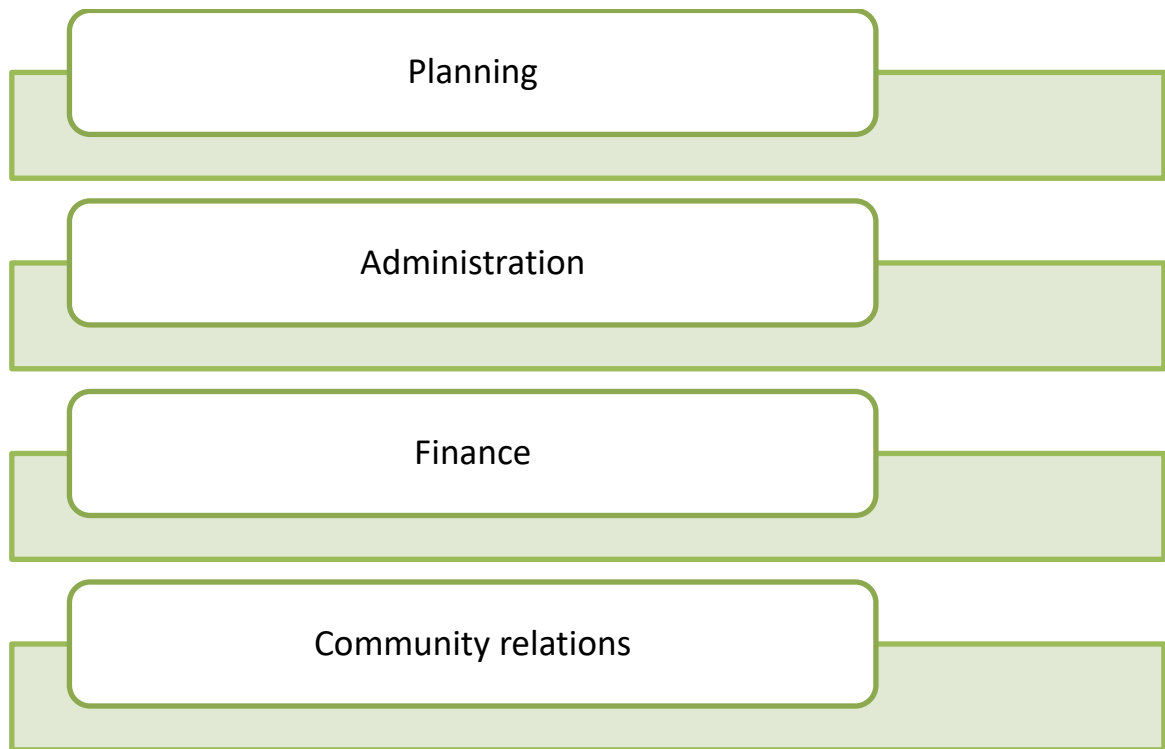
“It is only through a system of strong organizational governance that beneficiaries can be assured that an organization established on their behalf is indeed serving their best interests.”

Source (Progressio, 2016).

#### **Leadership**

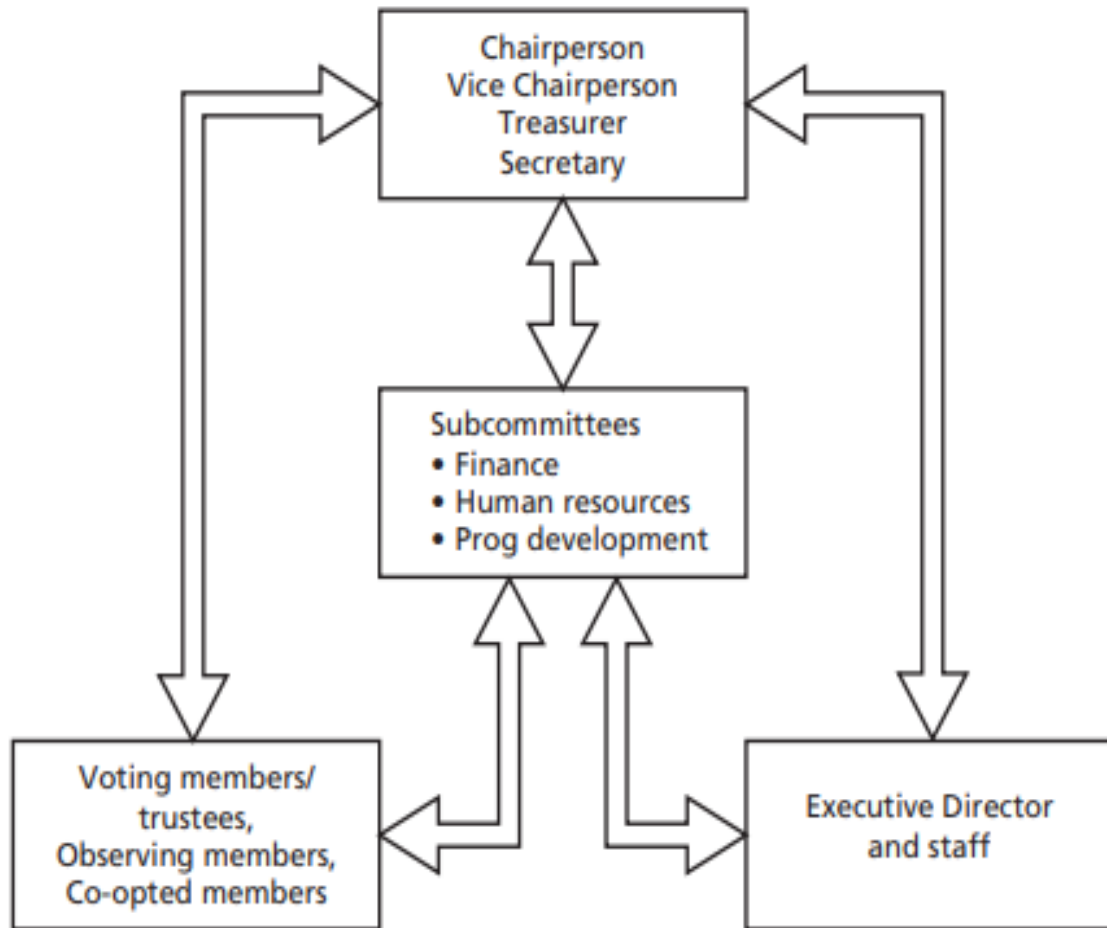
The quality of the leadership is required at all levels of positions. The roles and responsibilities of the different level of members and trustees is included in the governing document. Moreover, the job descriptions of all the roles will include the leadership qualities expected in the role.





**Fig 3.9 Roles of Governing Body**

The governing body will include the executive directors, trustees and some non-voting members representing interests of different stakeholders. The executive director doesn't enjoy the pleasure of a voting right since he or she is not a trustee. He is also accountable to the governing body since he is appointed by the governing body itself.



**Fig 3.10 Organizational Structure**

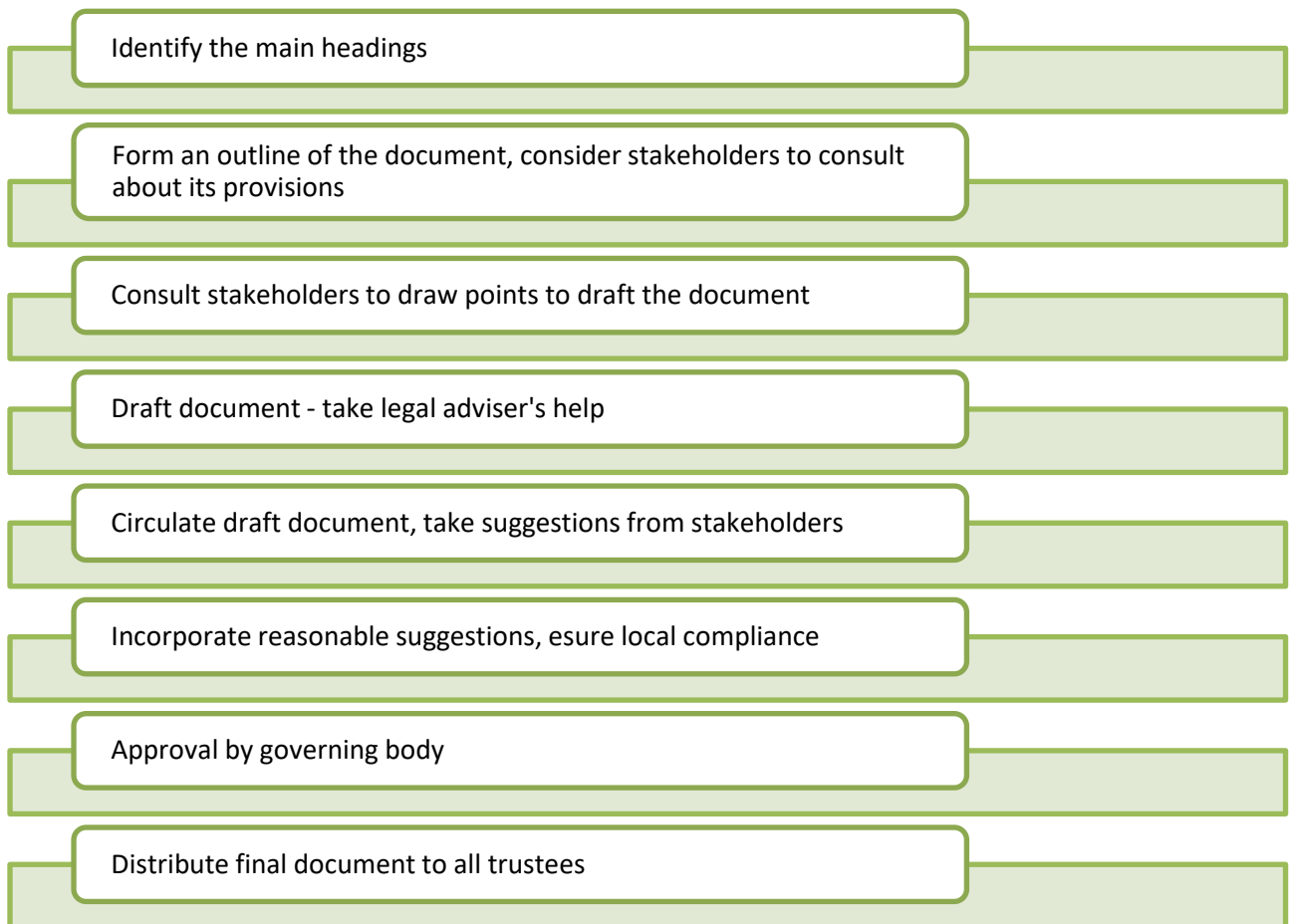
Source (Progressio, 2016)

### Governing Document

A governing document basically outlines the basic purpose of the organization. It can be in the form of a Memorandum of Association, a formal or legal document, a trust deed or a document carrying legal bindings for the organization.

Ideally a governing document must be developed at the time of starting u the organization as it will mention all the principles and rules on which the organization will run.

## Developing Governing Document



**Fig 3.11 Developing Governing Document**

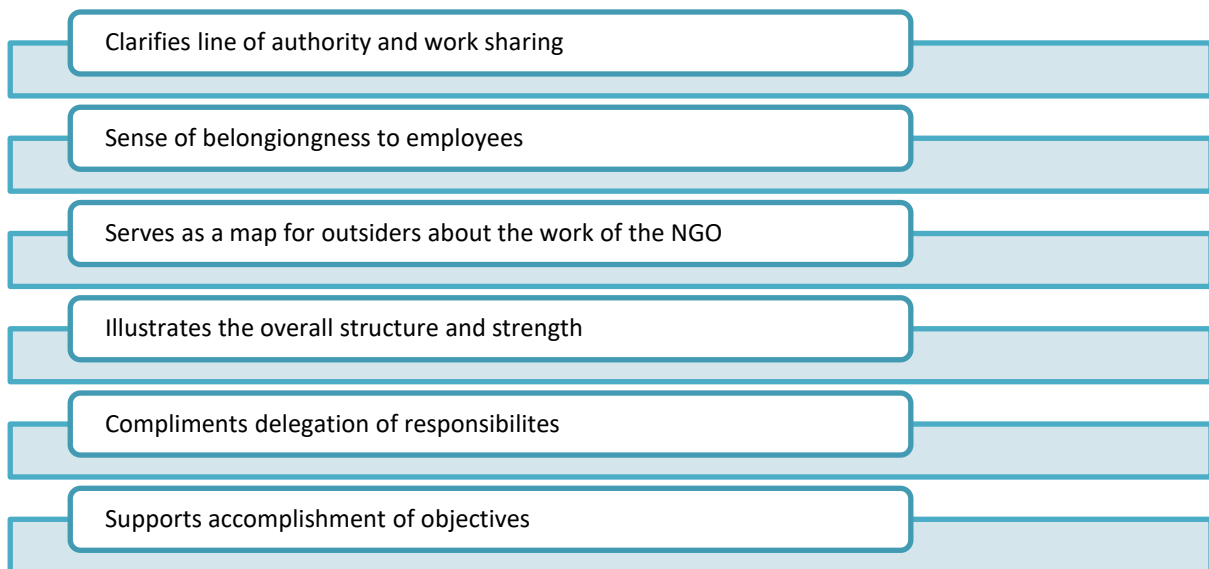
### **Organizational Policy Development**

The governing body is responsible for the monitoring the development and implementation of the organizational policies and rules. It provides guidelines via meetings that are held or through committees and sub committees. It can be a time-consuming process if not taken care of properly. Documentation should be kept minimum so as to save time and avoid complexity.

### **Office Administration**

#### **Organizational Structure Chart**

An organizational structure chart is a diagram that represents an organization, identifying its employees and departments and their relationships to each other.



**Fig 3.12 Pros of organizational Structure Chart**

### **Communications**

People outside the organization communicate with the office in three main ways

- Visit
- Telephone
- Letter or email
- Text message/ social media messaging

The basic principle of working of a NGO focuses on the fact that it must be easily accessible for the clients. People should be able to reach the organization and seek assistance and gather information.

A proper appointment system for the meetings should be established in order to ensure smooth functioning of regular work of the organization. A proper communication system should be established within the organization.

### **Record Keeping**

The primary step towards developing an efficient administrative system is to formulate an effective filing system for the organization. It facilitates smooth functioning of the organization when all the documents are systematically arranged and are kept in one common place. Moreover, it also helps in reporting the information to the concerned stakeholders in case of exigency by providing a quick access to the information. Since much of the information pertaining to the human resource management is confidential in nature, it is usually a good practice to have a confidential file for each member of staff which that person can have access to with the authorization of his or her manager, which may be Executive Director for most staff or any other person in authority. These files should be kept separately in a locked filing cabinet and rules concerning access to them must be clear and transparent.

### **Administrative Audit**

Similar to the financial audit, there is another important tool for keeping a check on the administrative activities, known as administrative audit. The key different between financial audit

and administrative audit is that in the former case, the financial systems are audited, whereas in the latter case, the administrative systems are checked. The administrative audit takes care of the functioning of the entire administration activities and examines if they are in order. This can be done in two heads

Internal (done by someone from within an organization).

External (done by external agencies)

**CHECKLIST: INTERNAL AUDIT**

**A. INTERNAL SYSTEMS**

- The NGO has a governing body (Board of Trustees or Board of Directors).
- There is a written organisational structure chart.
- There is a system for reviewing and following up reports that have been made for the organisation, and it is being implemented.

**B. FIXED ASSETS**

- The NGO has a clear fixed assets policy.
- The fixed assets policy is implemented.
- All fixed assets are recorded correctly in the fixed assets register.
- The fixed assets are counted regularly and the count is recorded.

**C. VEHICLE MANAGEMENT**

- The NGO has a comprehensive vehicle usage policy.
- The vehicle policy has been implemented.
- The NGO maintains a vehicle logbook, which is filled in completely and correctly.
- Procedures for vehicle servicing, insuring, tax and MOT (checking roadworthiness) are in place and up to date.

**D. INVENTORY**

- A written inventory management policy exists.
- The inventory policy is implemented.

When inventory is used, it is:

- authorised by the correct person
- properly supported with a supply request form
- properly recorded in the inventory (non-expendable supplies) register or supply control card
- the inventory is counted regularly and the count is recorded.

**E. PERSONNEL AND PAYROLL**

- A clear personnel policy exists and is implemented.
- All staff members have detailed job descriptions.
- There are defined systems of evaluating and measuring staff performance and they are in use.
- All staff members have current, written, signed employment contracts.
- Documentation and authorisation of payroll exists (such as timesheets and contracts).

**Fig 3.13 Internal Audit Checklist**

Source (Progressio, 2016)

In this section, we glanced at how the administrative tasks such as record keeping, communication etc. intertwine with the overall governing of the organization. We also gained an idea of how significant the governing document is to an NGO.

**Model Questions**

1. What are the defining characteristics of an NGO?
2. How are the MDGs leading to development? What are the updates on the same?
3. How are the SDGs leading to sustainable development? What are the updates on the same?
4. What are the differences between an NGO and Social Enterprise?
5. What are the differences between an NGO and a Development NGO?
6. How should people be selected onto the board of an NGO?
7. What is usually covered by the by-laws of an NGO?
8. What functions does the vision statement serve in an NGO?
9. How does framing a strategic plan help in the successful capacity building of an NGO?

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# Chapter 4 Managing Civil Society and NGO

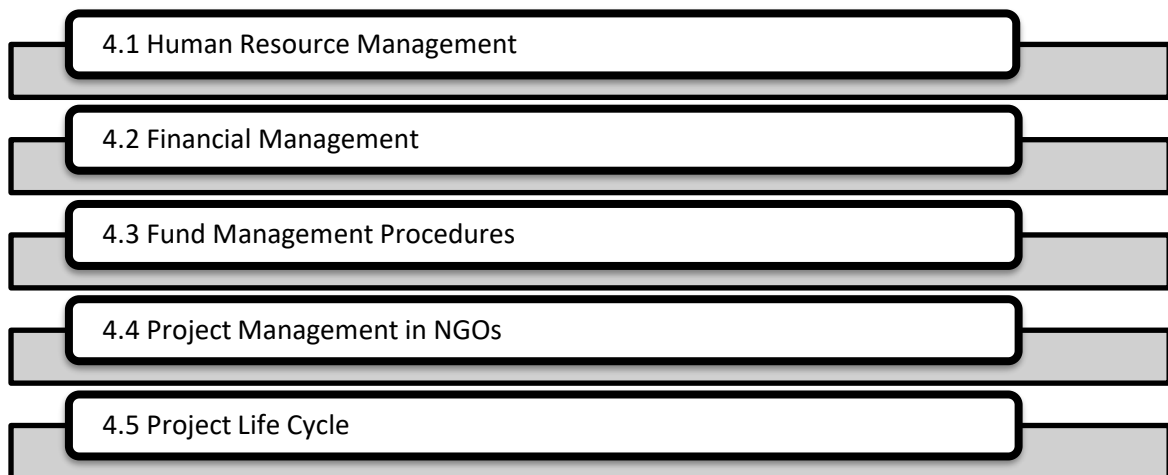
## Introduction

It can be inferred from the foregoing discussion that the human resources play a pivotal role in the functioning of an organization. Managing the human resources effectively and efficiently requires a great deal of planning and implementation. Thus, there is a need for formulating a policy that lays down the guidelines for managing people effectively. This policy essentially states the rules and regulations and the guidelines that are required to be followed in the normal course of business.

## Objectives

- To internalize the significance as well as steps involved in managing the workforce in an NGO.
- To grasp the need for financial management and accounting carried out in the proper manner.
- To get accustomed with the methods of managing the financial resources, drawing from the methods of recording and consolidating of financial transactions in controlling and managing financial resources.
- To internalize the various phases of a project in its life cycle and the key points to remember for each of them.

## Structure



### 4.1 Human Resource Management

Now, that we know that the human resource management policy plays a vital role, another important question that needs to be answered is how many policies should we ideally have to ensure smooth functioning of the organization? To answer this question, it must be kept in mind that the consistency has to be maintained in the structure of activities and hence, ideally there should be one policy that deals with the management of human resources in an organization. The nine elements of human resource management are illustrated in the diagram below.



**Figure 4.1 Scope of Human Resource Management**

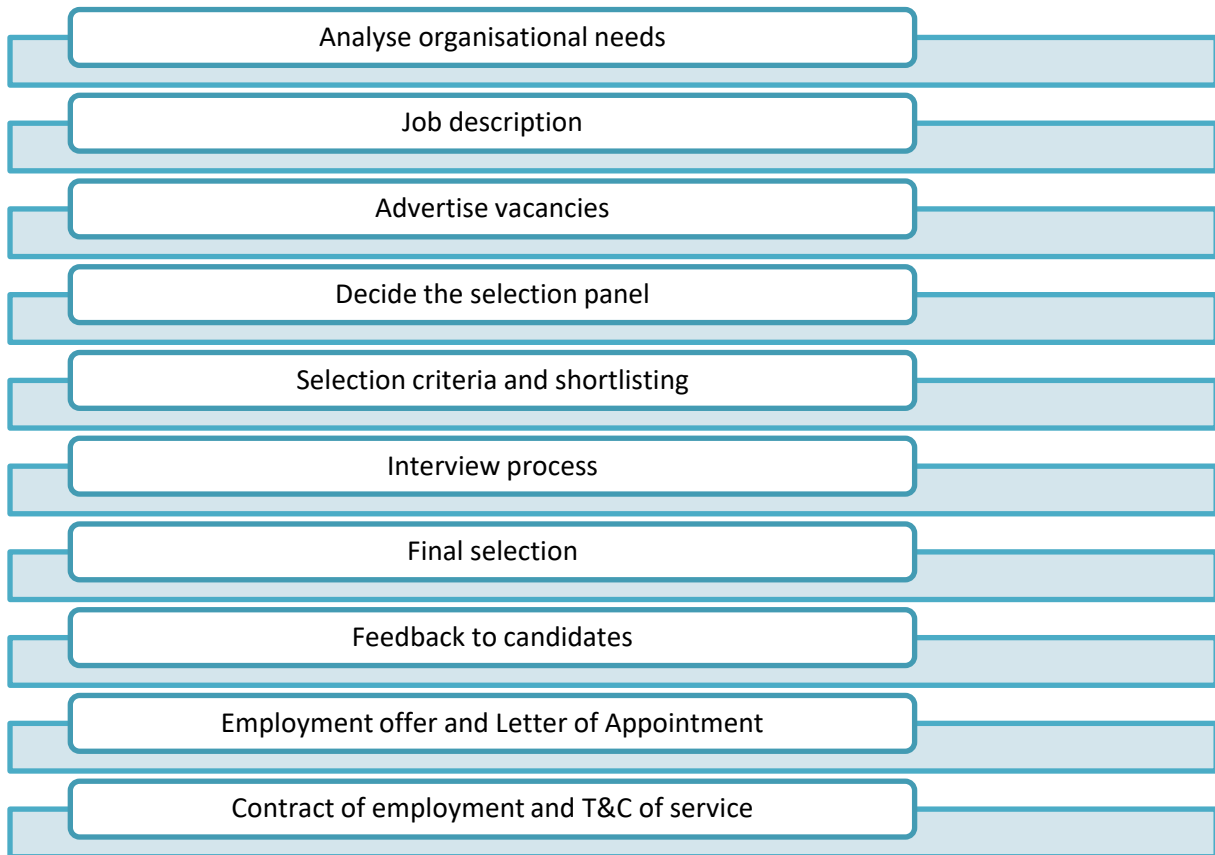
Source (Progressio, 2016)

### **Equal Opportunities and Diversity**

The first principle of human resource management deals with the equality in providing the opportunities. This reinforces that the human resource management policy should aim at providing equal opportunities to all the employees. By equal opportunities we mean that there should be equality in all the matters of an organization, whether they are related to employment or the working conditions. This implies that the work environment and the organizational culture should be a reflection of the discrimination free culture. This should not be confused with having diversity in an organization. The existence of diversity in workforce and the organizational culture does not necessarily mean that there is discrimination. To be effective, an organization must try to embrace these diversities and strive towards celebrating these differences by seeking a set of values and cultural ethos that do not have room for tolerating the discrimination and hence focus on active commitment towards promoting these diversities.

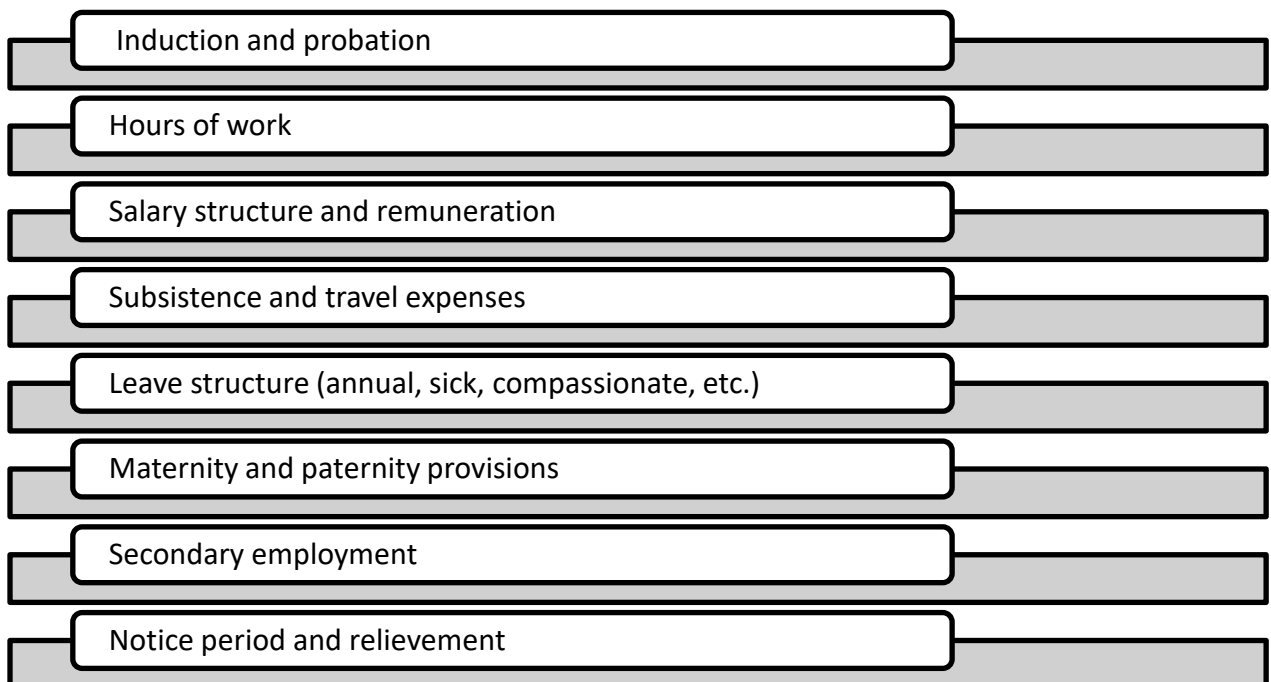
### **Selection and Recruitment**

Staffing is one of the most important processes in any organization as the quality of the employees will determine the success of the organization. The experience, education and skills of the employees definitely work towards betterment of enterprise. So, every organization must follow a proper recruitment and selection procedure so as to ensure that there is right man at the right place. This would enhance efficiency in the operations of the organization.



**Figure 4.2 Recruitment and Selection Process**

**Terms and Conditions of Service**



**Figure 4.3 Terms and Conditions in Service**

## Performance Management

The success of an organization is based on the way the employees are managed. The employee management focuses on employee satisfaction which in turn leads to job satisfaction, further resulting in employee commitment and betterment of the organization. This laid emphasis on the role of performance management system in an organization. A performance management system incorporates the various elements of measuring performance and also defines the criteria for measuring the performance.

### KEY PRINCIPLES

#### 1. Assess the benefits for the organisation

- What are the main benefits of performance management for the organisation?
- What are the main benefits of performance management for the individuals the organisation employs?

#### 2. Agree on key processes

- How will the organisation ensure that the performance management system adopted is fair, transparent and accountable?
- Who will be responsible for reviewing the performance of the Executive Director (for example, the Chair of the governing body)?
- Will the Executive Director delegate responsibility for reviewing the performance of more junior staff to others in the office? How will the line managers give feedback on junior staff performance to the Executive Director?

#### 3. Agree on reviews

- When will annual performance reviews and interim reviews with staff take place?
- Will the agreed outcomes of all reviews be kept on the individual staff member's file or will the interim reviews simply be more informal than the annual review?

#### 4. Discuss preparation

- How will staff prepare themselves for performance reviews?
- Does the organisation have the necessary skills to implement a performance review system or is training required?
- How might such training be acquired?

**Figure 4.4 Principles of Performance Management**

Source (Progressio, 2016)

## Staff Development

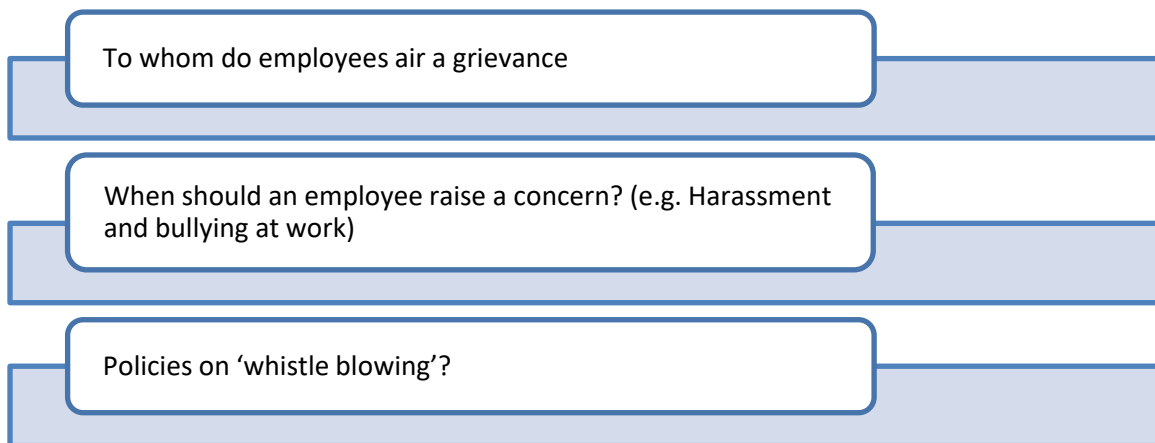
It is the most effective factor that helps in employee retention. It also leads to employee satisfaction and increases their morale. Staff development actually increases an employee's knowledge, skill and potential. Staff development activities will ultimately lead to enhancing effectiveness and work efficiency of the employee and ensures that the staff performs better.

Staff development can be both in form of formal training and other informal programmers.

## Grievance Mechanism

Many times, certain organizational issues cannot be solved through simple communication. It requires a formal procedure to solve the issue. Every organization must necessarily have a policy through which problems related to staff can be solved effectively. Grievance policy today forms a

most important part of a corporate structure as it will the organization to solve the complex problems in a simpler form. It will also create a positive feeling among the employees. The below factors have to be kept in mind while framing a grievance policy



**Figure 4.5 Grievance Mechanism**

### **Health and Safety at Work**

Reasons to have a health and safety policy for the organization

- Ensure safe and healthy working conditions.
- Sharing health and safety related information with all.
- To express organizational effort regarding the health and safety issues.
- To work as per the rules and guidelines set.

(Progressio, 2016)

We learnt about the elements involved in planning for, recruiting, and managing the workforce of an NGO. We also glanced at various steps involved in selecting the right staff members.

#### **To Do Activity**

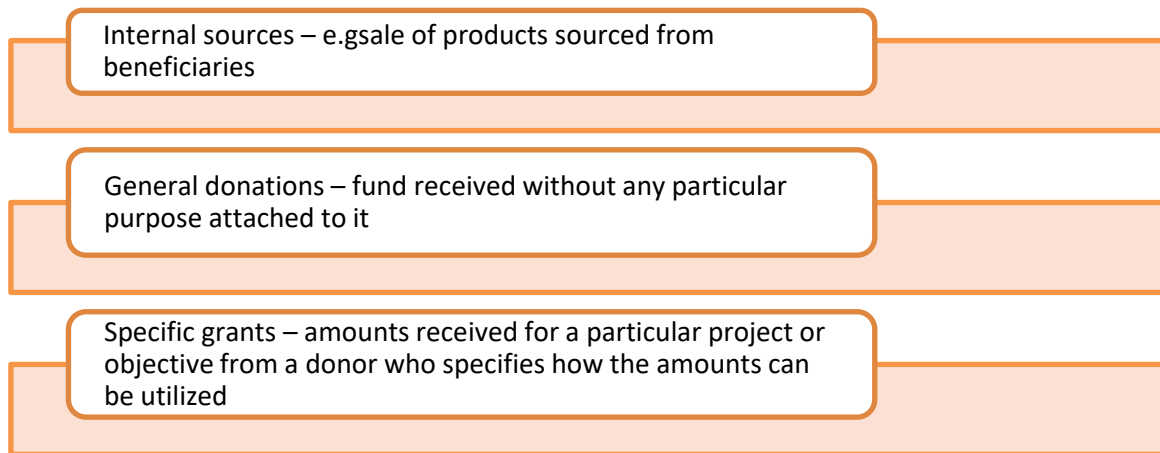
Take up any NGO and analyses its working, operation and management. Is it different from the working of a non- NGO? If yes, what are the key points upon which working of NGO and non-NGO be differentiated.

## **4.2 Financial Management**

Funds or grants are the lifeblood of organizations. In the case of not for profit organizations, these funds are usually received as donations or grants. While managing money is important in any context, managing and applying the money of others as per the agreement has an element of trusteeship also, and has to be done with utmost care and seriousness. The principles and reasons for fund management, accounting and tracking remain common across all types of organizations, though the techniques used can vary a little from one type of organization to another.

## Fund Management

Fund refers to monetary resources available for achieving certain objectives. Any project that is undertaken is dependent on resources in kind or cash to achieve its' objectives. A few typical sources of funds may be.



**Figure 4.6- Sources of Funds**

Management of funds refers to applying the monetary resources in an efficient and effective manner in order to achieve the objectives of the project. Note that we have used the terms efficient and effective. Efficient refers to using the optimal or correct amount of funds for each activity (for example, purchasing items of the quality needed – neither lesser nor higher). Effective refers to ensuring the successful completion of each activity while expending only the required and budgeted amount (ensuring that no money is wasted without results).

While the accountant, finance manager, cashier or other finance related personnel have special responsibilities when it comes to fund management, it is extremely important to note that every member of the team shares some fundamental responsibilities when it comes to money – Spend the funds as cautiously/ more cautiously than you would spend your own money since it has been given to your project with trust.

Ensure it is spent for the purpose specified and not for anything else. In case expenditures have to be undertaken for unapproved purposes, please ensure that approvals are taken in advance.

Ensure that the activity or item for which money was spent contributes to the specified goal. This also connects with the earlier point about specified purposes. Overall, all spending should contribute towards the achievement of the project objectives.

- Ensure that there are no losses and leakages. All amounts spent by every individual must to reported correctly and in a timely manner.
- Ensure that all guidelines for spending of funds are followed and common sense is always applied.
- Ensure that bills and other documents are properly procured and maintained for all expenses.

As can now be appreciated, all the points mentioned above relate to every member of the project team since money is handled directly or indirectly by everyone.

### **Basic Principles**

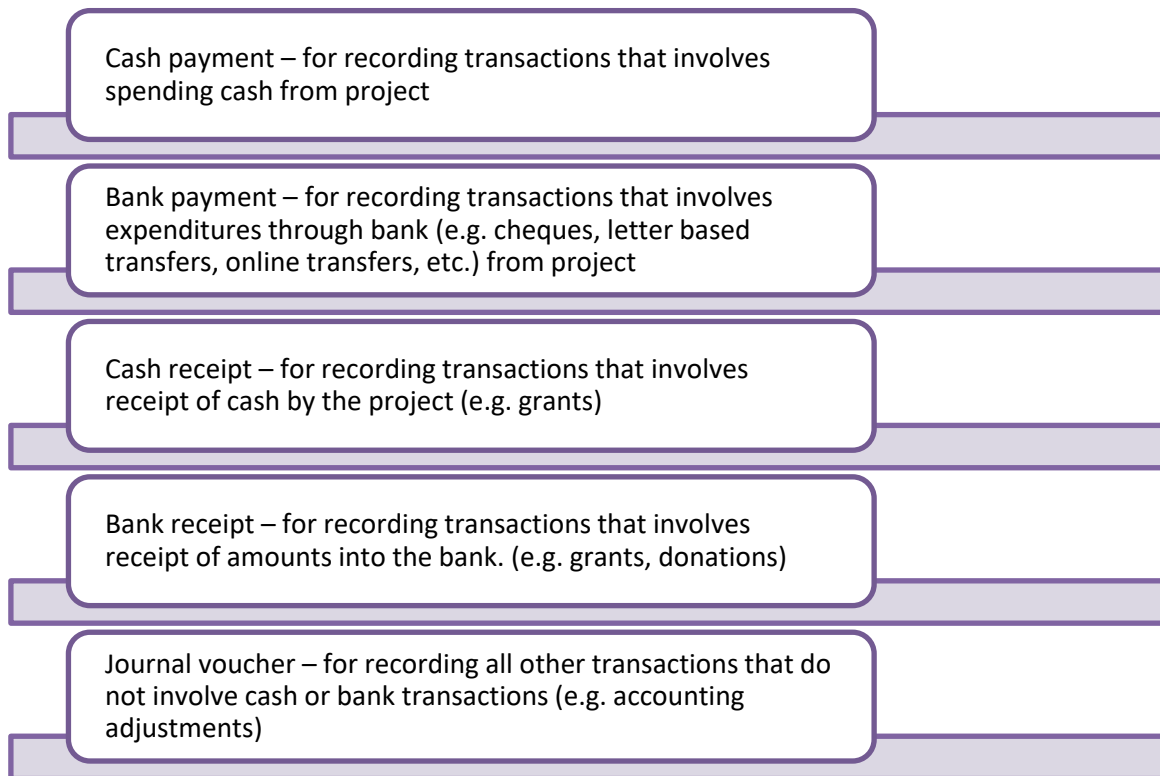
Spending based on approvals is an important control system. This serves many purposes. It ensures that the proposed expenditure is brought to the notice of the person authorized to expend. This results in the responsible authority being able to track the expenditure against the progress stage of the project and also against the budget. It also helps in discussing and ensuring due procedures are followed at the time of spending, which may otherwise be inadvertently omitted if proper approvals are not taken from the correct authority.

The implementation of the above point requires that financial responsibilities are clearly designed, delegated and communicated to all in writing. This ensures that all team members know who is responsible for what approvals, for custody of stock or assets, for cash management, for record keeping etc. Based on the same, certain persons in the project will be provided with authorization spending cash or signing cheques. Also, certain persons will have the authority to sign on behalf of the project. This should also be clearly communicated to all persons in the project, in writing. This ensures that only authorized persons represent the company in contracts and in official communications with the external world.

All incomes and expenditures must be recorded correctly and promptly. Given the nature of book keeping, delays in noting down details and creating vouchers may lead to confusions or even loss of appropriate supporting documents as time elapses. A simple example that most of us can relate to is the loss of supporting documents in travel claims as we delay the time to make the travel claims – invariably, some bill or receipt is misplaced or forgotten.

Vouchers are the most basic mechanism for recording and entering data into the accounting system. They can be simply thought of as template documents that ensure that all basic information about a transaction are captured systematically. The types of vouchers used are





**Figure 4.7 Principles of Fund Management**

The utility of the voucher comes from the fact that it is pre-printed (or pre-designed in the case of computer-generated vouchers) to ensure the noting down of key details. This helps in making sure that information that is pertinent to the transaction is neither omitted nor forgotten. The vouchers are also serially pre-numbered. This also is an important system to track that no vouchers are misplaced or forgotten. The details required in vouchers are –

- Project Name, voucher number (pre-printed)
- Date, Account (to be debited and/ or credited), Narration, Amount
- Supporting documents
- Authorizations and signatures
- Revenue stamp for payments > Rs.500

As can be seen from the above list, the details collected are comprehensive and the narration column allows for detailed remarks to be noted and maintained. Also, a key requirement of a voucher is the availability of supporting documents. These are basically billing, receipts, invoices or documents of similar nature that provide external (to the project) evidence of the nature and value of the transaction.

### **Books of Record**

Vouchers form the records of primary entry. While individual vouchers provide detailed information about particular transactions, we need grouped and summarized information in order to get the larger picture. This is accomplished at the next level by entering the vouchers into the cash & bank book and into the ledger.

### **Cash & Bank Book**

The cash & bank book is a single book that is used to consolidate all the transaction related to cash and bank transaction from the cash or bank balance perspective. This book, in the physical form, has two pages dedicated to each day with receipts being recorded on one page and the payments on the other. There are columns provided for voucher number, particulars, account being debited or credited (the other half of the double entry), and the amount. The amount will be noted under cash column or bank column(s) depending on whether it is cash or bank transaction. Also, important to note is that every day, the balance from the previous day is brought forward for the cash and the bank(s) columns and at the end of the day, after all the transactions are noted and recorded from the cash and bank vouchers, the closing balance is recorded. It is also common practice that the cashier cross verifies the physical cash balance and notes the denominations on the same page after closing the balance as a record and for reassurance that the physical cash balance tallies with the cash balance as per the books (which it should!).

### **Ledger**

As can now be seen, the entries in the cash book take care of consolidating the impact on cash and bank balances on a daily basis. However, every transaction also affects other items. For example, when you spend cash in order to buy stationery, you are not only reducing your cash balance, you are also getting stationery. The fact that stationery has been procured needs to be recorded for multiple reasons – in order to compare the expenditure against budgets, in order to understand total expenditures on stationery, in order to know the status of stationery purchase etc. Thus, just as we consolidated all cash transactions through entries into cash book, we consolidate the corresponding aspects of the transactions into separate accounts in the ledger (example Stationery account, Rent account, Donations account etc.). Each account will have a debit and credit column under which the amount will be noted and columns for entering the date, voucher number etc.

All cash and bank vouchers will affect the ledger through one entry (into the corresponding affected account). This is the case except for cash withdrawals from bank and cash deposits into bank where both the entries will get reflected in the cash and bank book itself on the same date. For journal vouchers, both aspects of the transaction will be entered in the ledger itself, into the two affected accounts.

### **Asset Register**

Often projects have provisions to purchase assets. Otherwise, assets are acquired by the organization from own funds or from other donations. Since assets, by definition, are meant to provide benefits for a longer duration, it is important to record their details and keep an updated list in order to be able to track and trace. This helps in ensuring that assets are not lost, misplaced or stolen or even if any of these events occur, the team can find out which particular item is missing from comparing the remaining physical items against the records.

The asset register is the book that records details of different assets. These details include date of purchase, amount paid, invoice details, identification details of the asset (including any serial number, registration number etc.), the physical location of the asset, the asset tag number provided by the project, date and mode of disposal and any other remarks. The asset tag number provided by the project should be noted on the asset through a sticker/ etching, etc. Any movement of the asset

should be updated in the register. This register should be maintained in physical format with entries in permanent ink. Periodic physical verification is recommended (at least once in a year) in order to verify that all the assets as per the register are available with the project/ available with people to whom they have been assigned by a person authorized by the project (example – laptop assigned to a project member).

### **Stock Register**

The stock register keeps track of items that are consumable in nature – stationery, communication materials, and other materials that would be used in the running of the project or distributed to beneficiaries. One or more pages would be allocated to noting the stock movement of a particular item with columns for date, quantity received, issued and balance as well as columns for person issued to and signatures of the issuing authority and the person receiving. The stock register has to be maintained in an updated manner and should be handled only by an authorized person. Physical balance of stocks needs to be cross verified against the balances as per stock register on a period basis (at least once every year).

### **Bank Reconciliation**

The balance as per the accounts book needs to be verified against the balance as per the bank passbook or bank statement. However, unlike cash book and cash balance, the bank balances as per bank column in the cash book and the bank statement may not necessarily tally. This can happen due to the following.

- Cheques may have been issued but not presented at the bank by the receiver. Thus, as per our bank column, the amount has already been reduced, but in the bank, this amount still reflects in the account.
- Cheques or amounts may be directly deposited to the bank account by donor or other parties without intimation to us. Thus, the balance as per bank statement will reflect a higher amount than the balance in our cash and bank book.
- Cheques that are received physically by the project but not deposited into the bank will result in the bank column of the cash and bank book reflecting a higher balance than the bank statement.
- Even in cases where the cheques have been deposited, till they are cleared by the bank, the balance in the cash & bank book will reflect a higher amount than the bank statement

Bank charges that are debited directly by the bank into the account. When this is not intimated by the bank to the project, we can see how this will lead to a balance that is smaller in the bank statement than in the cash & bank book.

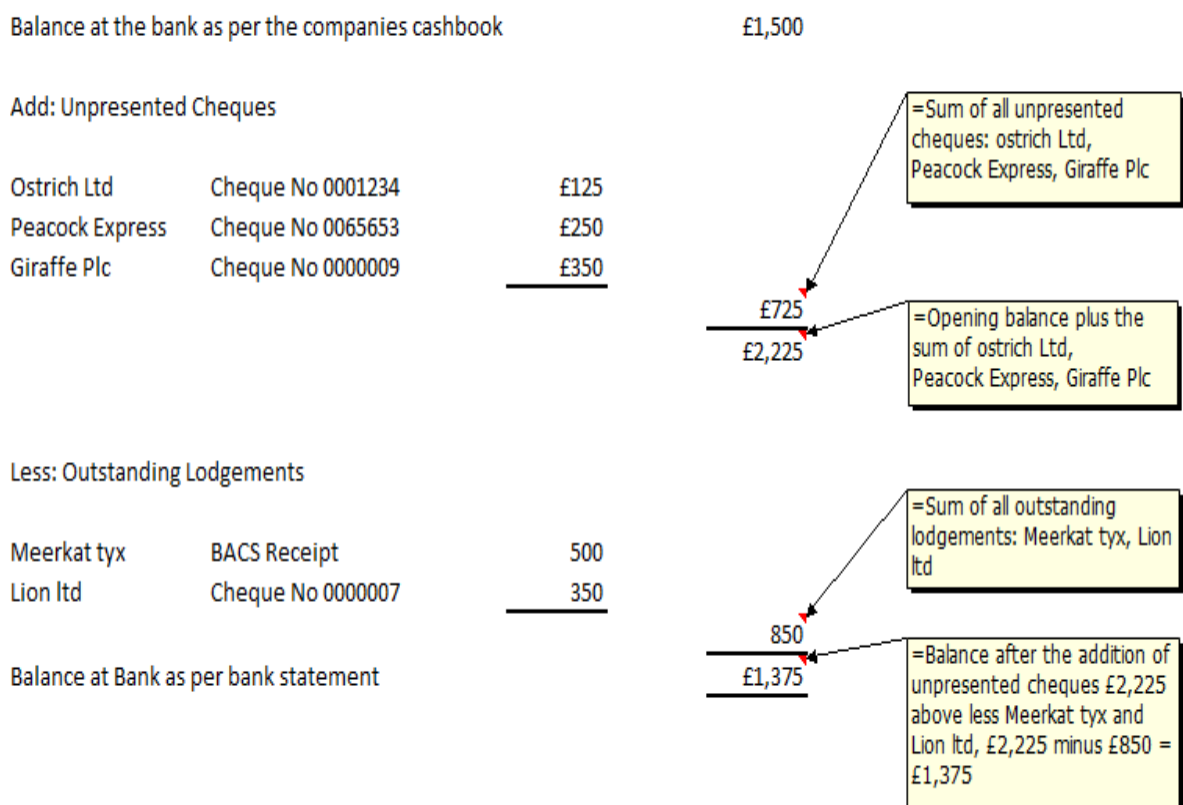
Any one or more of the above reasons can result in the balance as per the cash & bank book not matching with the balance as per bank statement. Thus, at a given point in time, these balances may not match for reasons that are perfectly acceptable. In such a situation, the recourse we have is to check and understand the reasons for the two balances not matching. If this difference can be explained by way of transactions of the nature listed above, then the balances can be considered to have matched.

The process of matching the two balances is called bank reconciliation and the statement that systematically identifies and records the two balances and the transactions that form the legitimate difference between the two balances is called the bank reconciliation statement. This statement is prepared periodically (weekly, fortnightly, monthly or quarterly depending on the volume of bank transactions – if the transactions are more, then the statement has to be prepared more frequently).

**To Do Activity**

“Finance is the life and blood of business.” But an NGO generally does not have a profit motive then how are the finance issues handled in a typical NGO. Study about the financing options available and its actual use for NGO.

**Bank Reconciliation Statement**



**Figure 4.8 Sample Bank Reconciliation Statement**

We picked up information on the elements involved in accounting for and managing the financial components involved in running an NGO operation.

**4.3 Fund Management Procedures**

Budget is one of the most fundamental documents in resource management. This unit lays down the procedures adopted by the civil societies for managing their funds. It also highlights the importance of budget and the process of formulating the budget.

### **Budget Management & Analysis**

Budget is one of the most fundamental documents in resource management. The budget is the planned estimate of resources required (or available) in order to produce a given outcome of an expected quality and quantity. At the outset of the project, a budget is created and agreed to with the donor. The budget is usually made line item wise and contains information about quantity as well as amount. For example, the budget can refer to an allocation of Rs.10,000 for printing of 5,000 leaflets. This implies that the cost expected is Rs.2 per unit. However, in other portions of the budget there can be specifications on the quality expected (size of the leaflet, quality of paper, single or multi-color, etc.).

### **Budget Management**

The agreed budget forms the basis of financial management in a project. The activities are planned in accordance with the budget available. Expenditures are made as per availability of budget and the person approving expenses has to keep an eye on the amounts already spent and balance available before providing approvals for expenditures. A budget is usually a realistic estimate of the amounts necessary for achieving the planned activities, objectives and goal of the project and keeping track of actual expenditures till date before approving further expenses helps the manager in not losing track.

### **Budget Variance Analysis**

While the budget acts as a basic estimate of the proposed expenditure, it can also serve an important purpose after expenditures are made. This stems from the analysis of actual expenditure against the budget. This analysis is also called variance analysis since it analyses the variation of the actual expenditure against the budget. Variance analysis can be done in different levels and each of them will provide a different insight –

- Difference in total expenditure versus budget
- Difference in line item wise expenditure versus budget
- Difference in quantity/ level of activity (actual versus budget)
- Difference in timing of expenditure versus budget

The differences need to be analyzed and the impact on the project needs to be understood by the manager. If there are adverse impacts, then the manager needs to initiate steps to ensure that variances do not arise in the future, by keeping better track of the expenditures. In case the variance is unavoidable, then the budget maybe considered as not realistic based on ground situation. Discussions need to be conducted with the donor to explore the issue and to revise the budget in keeping with the ground realities.

### **Procurement Process**

In projects that have many consumables or materials that need to be provided to the beneficiaries, procurement becomes an important function of the finance team. Since items need to be purchased in large quantities, it is important the required quality materials be procured at the least possible price. It is also important the procurement does not happen only on the basis of known contacts since this can lead rise to real or perceived benefits to the person making the procurement.

In order to do and to be seen doing fair procurements, the project should have a procurement policy in place that specifies the manner of procurement for contracts of different values. Usually, low

value procurements are done at pre-contracted rates from empanelled vendors (example stationery items at pre-agreed rates from a empanelled stationery outlet). The empanelment process may be done once in a year by calling qualified vendors to submit quotes for the items expected to be regularly procured during the year. For items of medium value, the process can require multiple independent quotations from qualified vendors and the lowest quoting vendor maybe awarded the contract. For high value items, usually sealed tenders are invited through advertisement in newspaper and contracts are awarded based on quality and pricing.

It is important that the project has these processes in a written manner and circulated to all concerned. All procurements should be done based on these processes. The process must also contain safe-guards to ensure quality post awarding of contracts to vendors, in the form of bank guarantees and/ or retention money.

The donor may also prescribe processes and formats for standardized procurements. In such cases, the project must ensure adherence to these. In case the donor's requirements are silent on any issue, then the project must fall back to its own internal processes.

### **Advances Management**

Advances are provided by the project for travel, for minor purchases, against procurements etc. As a matter of propriety, these advances need to be followed up and closed within a reasonable amount of time in order to ensure that there is no misuse of funds. In the first instance, any request for advance must be submitted by the project personnel in the appropriate format. The submitted format is to be then checked and forwarded to the appropriate authority for signature. Based on the signature, advance is released, usually as a cheque or bank transfer in favor of the recipient of the advance. Only in exceptional circumstances should advance be given as cash, at that too with clear remarks on the exceptional need for release of cash and with the signature of the approving authority.

The person taking the advance should utilize it only for the purpose for which the advance has been released (travel advance should be used only for travel purposes and should not be used for purchase of any materials or assets). Within the required number of days, or within a reasonable period of time (example, a week after the travel is completed), the advance should be settled along with all the required documents (usually, the tour report, the bills and the balance amount). In case the advance is not settled on time, it is the responsibility of the finance personnel to follow up and if necessary, take up the issue to the notice of the project authorities. An advance is provided for facilitating an express activity and should not allowed to be misused for any other purposes. It is also important for the project management team to verify this on a random basis and compulsorily verify any balances before doing the full and final settlement of any team member who leaves the project.

### **Tax**

Non- profit organizations are exempt from paying tax as long as they do not indulge in any commercial or business activity and apply the grants, donations and income from any property to a charitable purpose. However, the NGO/ Trust still needs to register and get a TDS registration number and deduct and pay taxes on all payments to vendors as per the stipulations of income tax act and rules. Amounts should be deducted before making the payment and the should be deposited within the due date. Also, at the end of the financial year, form 16 (for salary TDS) and form 16A (for

non- salary TDS) needs to be issued to all the employees/ vendors from whom tax has been deducted.

Service tax is also applicable to NGOs unless specifically exempt. Registration needs to be taken for service tax if total services provided exceeds Rs.9 lakhs per annum. Service tax needs to be added to the service amount by the NGO for services provided. This amount is recovered from the customer benefiting from the service (not the beneficiary, but the donor or company on who pays to the NGO for performing a service). The service tax amount, along with the returns has to be submitted within the due date.

### **FCRA Registration**

Foreign contributions regulation act (FCRA) is the act that oversees all foreign contributions made to charitable activities in India. Any NGO receiving funds of foreign origin needs to register itself with the Ministry of Home Affairs. The NGO shall also open a FCRA designated bank account for receiving all funds from foreign sources. It should be noted that every NGO shall have only one FCRA bank account for receiving all foreign funds. Opening of multiple FCRA bank accounts is prohibited.

Funds received by the NGO in the FCRA account shall be used specifically for the purposes for which they have been received. Application for other purposes is not permitted. The NGO shall also provide an annual return to the ministry of home affairs in the prescribed format.

Further detailed information on the act and answers to frequently asked question on FCRA can be procured from <http://mha.nic.in/fcra.htm>

### **Contracts & Other Documents**

During the course of the project, many important documents are received and issued by the project. These documents have legal and financial implications and the project must take care to have these documents and copies secured in an organized and safe manner. A general list of documents & contracts (indicative, not exhaustive) is –

Rental agreements (office building, clinic, etc.)

- Ownership documents for any property owned by the project – building, vehicles etc.
- Ownership/ invoices and warranty documents for assets purchased by the project
- Employment contracts for employees
- Consultancy contracts for consultants
- Guidelines, manuals, other documents issued by the project
- Originals of any artwork (leaflets, advertisements, etc.) commissioned by the project
- Reports and basic documents of any studies commissioned by the project

While the original documents must ideally be kept in a safe or in other locked cupboard, copies of the same must be available in another physical location. In a similar manner, copies of all-important financial documents (audited financial records, tax registrations audit reports, financial statements, digital back up of accounts) must be also kept in a separate physical location. This is for safety and continuation in case of any physical damages to the project location.



We internalized various aspects of financial juggling involved in an NGO operation such as budgeting, advancing, tax compliance, etc.

#### **To Do Activity**

Study about the two NGO's Child Rights and You, and Help Age India. Study there working and based on your study develop a strategy regarding management of funds by an NGO. Take care of rules of the govt. as well.

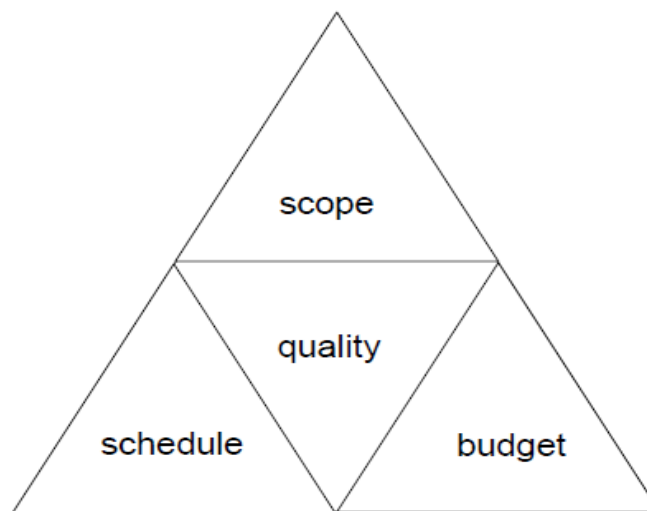
### **4.4 Project Management in NGOs**

Project management has increased in relevance in the past few decades with the increasing understanding of its utility in the successful completion of time and resource bound ventures. The application of project management principles to public health projects in the last two to three decades, especially in the western world has brought about better outcomes.

#### **Need for Project Management**

Projects essentially are time bound ventures designed to achieve a certain predetermined objective. They can be defined as collaborative enterprise carefully planned to achieve a particular aim.

Need for PM in an NGO can be explored here <<https://www.youtube.com/watch?v=AtmbhQGfMos>>



**Figure 4.9 Need for Project Management (Golden Pyramid)**

Source (Carroll A. , 1991)

Project Management can be understood as the act of people and resources coming together for a pre-determined period of time to achieve a particular aim in an efficient and effective manner. Efficient and effective are often used interchangeably. However, they do not mean the same thing. Efficient refers to achieving maximum productivity with minimum wasted effort or expense, whereas effective refers to the ability to produce a desired or intended result. As we can see, efficiency may give maximum output while spending the least resources, but may not achieve the desired result. On the other hand, effectiveness may achieve the desired result but may not do so at the least cost. In management and in project management, we try to be efficient as well as effective.



**Figure 4.10 Phases of Project Management**

Source [Demystifying the 5 Phases of Project Management – smartsheet.com](https://www.smartsheet.com/5-phases-of-project-management)

All projects need to be managed under certain constraints. These constraints sometimes are imposed from outside (like the donor). If they are not imposed from outside, it is in the project owner and manager’s interest to define them. This is because these four constraints also act as enablers. As we go through the rest of the module, it will become clear why defining these constraints are necessary and what role each of these constraints play on the successful management and completion of the project.

It is also important to be able to distinguish between institutions and projects. Let us look at an example below.

Here is a video that tries to give an idea of how NGOs typically manage projects  
<https://www.youtube.com/watch?v=sK9RIRj1zY>

## Institutions Vs. Project

- Pulla Reddy Sweets Vs. Building canal
  - What is the time frame?
  - What is the objective?
  - What is the structure of management
- Compare Apollo Hospital Vs. your project
  - What is the time frame?
  - What is the objective?
  - What is the structure of management

**Figure 4.11 Institution vs. Project**

Hint – Essentially institutions will have a perpetual time frame (running forever) while projects will have a pre-defined timeframe. The management structure of institutions will be elaborate and will

be oriented towards the long-term survival and success of the firm (example – there will a team which looks at business expansions). However, the project management team structure will be short term and will be defined exactly as per the requirements of the project.

### **Scope Management**

Scope Management is perhaps one of the most important components from the lifetime perspective of the project. Scope defines what is expected of the project and what is not. This helps in clarifying the goal to the project team as well as to the various stakeholders. Since the focus is clearly on what will be done by the project, the objectives and the activities of the project are also better defined. This in turn helps in schedule management.

Usually, the scope of the project, in terms of the goals and objectives is provided by the donor or is agreed with the donor. In projects where this is not the case, or where the project is created using own funds, it is an important exercise for the project owner and the manager. Not defining the scope of the project clearly can lead to situations where the project resources are not focused and get spent in various directions due to lack of clarity and changing priorities.

### **Schedule Management**

Schedule management is the process of creating a timeline of activities and tasks through the project period, the completion of which will help achieve the project objectives and goal. A simple manner of understanding this is to look at a car drive from Hyderabad to Mumbai. The journey is of several hundred kilometers. Before starting on the journey, you will make a plan and note down various towns and landmarks on the way so that you know you are on the correct path. You will also note down where you will stop for food, for a rest and where you will sleep. In a similar manner, a project can be scheduled for its' duration.

The first step is to break the objectives created in the earlier process of scope management into activities and tasks. These are then plotted against the calendar in such a manner that dependencies are taken care of. Dependencies refer to situations where one activity depends on the completion of another. For example, you can do one to one communication using a leaflet only after the leaflets are printed and ready. So, the one to one communication activity using the leaflet is dependent on the activity of designing and printing the leaflet.

Alongside the activity and tasks that are now noted on the calendar, the person responsible for each task is also noted. The resources required and the outputs expected for each activity are also noted. During the implementation of the project the activities undertaken are monitored against the schedule and deviations are noted and analyzed. Consistent deviations may require the management team to discuss with stake holders in order to correct the issue or to revise the schedule in case of genuine issues in keeping to the planned schedule.

### **Budget Management**

It is important that the budget for the project be clearly defined before the commencement. Usually this is not a problem since the donor provides a specified budget amount along with expenditure heads and sub-heads with the allocation under each of these heads and sub-heads. In case of

projects that are run with donations or own funds, the project owner and manager have to do this exercise and define the budget and allocations.

A useful video on project cost management can be found here

<https://www.youtube.com/watch?v=oXhgwn-girl>

Another video on project budgeting here <https://www.youtube.com/watch?v=hePqA01jS1I>

At the time of creation of the budget, it is also important for the project management team to clearly plan the level of activity against the budget amounts. This is crucial since the project can remain within the budget during implementation, but may not function at the activity level that was planned. For example, if the amount allocated for field travel for an employee for a month is Rs.5,000, it is important to also define that the employee is expected to spend 10 days in the field in the month. Later, during implementation, the monitoring will include not only checking that the actual amount spent is under Rs.5,000, but also that the employee has spent 10 days in fieldwork. Keeping the spend at Rs.4,800 while having worked in the field for 5 days should actually be noted as overspending or inefficiency.

In terms of monitoring, the project management team should also ensure that due authorizations are available for every expenditure. Monitoring would also include periodic checks, internal and external audits and reporting to stakeholders on the levels of activity accomplished and the under/over spend against the budget.

### **Quality Management**

Defining the quality standards of the project is an often-ignored enabler. The importance of this enabler lies in the fact that this has a direct impact on the beneficiaries of the project. Quality should be defined in measurable terms for all important activities. For example, a bank measures the quality of customer service at the call center by multiple means. It checks the amount of time a person has to hold the call before being attended to, the time it takes to provide a solution to the caller, whether the issue was resolved at the end of the call and the actual satisfaction rating provided by the caller after the call.

From a project perspective, quality standards can be defined in terms of the quality of any goods or services provided to beneficiaries. For example, where a project is providing free notebooks and pens to school children, the quality of the notebook, the number of pages it should contain, the number of notebooks given to each student, the time duration in which it would be given to the student should be defined.

As with the other enablers, the quality of the outputs should be routinely or periodically monitored against the standard and any deviations should be looked into. Quality management needs to be taken very seriously because the beneficiaries usually are not in a position to raise a voice or complain since they feel indebted for any help received. For example, a student is unlikely to complain against the project if she receives five 80 pages notebooks instead of five 100 pages notebook. However, the project management team should be aware that the student has a right to get the correct notebooks.

### **Contract Management**

Contract and supplies management is also known as procurement management. Common sense suggests that we should plan for the procurement of all items based on their perishability and on the time of need. If the items are non-perishable, like leaflets, and they are needed every month for one year, then the entire procurement for the year should be done in one lot so as to get the best rates. Based on the scheduling done earlier, the project management team already knows the inputs that are required. This is then organized in a schedule and purchase planning is done. Based on the bulk and the value of the purchase, the appropriate procedures should be followed for getting the items. Details of the procurement process and rules are provided in the finance management training module.

### **Team Management**

The soul of any venture is its' people. This is a fact that is increasingly acknowledged by all organizations, large and small. The project must first create an organogram (a chart depicting the different roles in the project and how they are connected to each other). The roles provided here will be the same as the roles that were marked out for activities in the scheduling portion earlier.

Once the roles are marked out, the qualifications, experience and other requirements for each role are identified and defined. The training that needs to be provided to each role holder is also identified. The training can be a single one at the time of joining or multiple rounds of trainings, with an induction training at the time of joining and one or several more rounds of training subsequently.

The appraisal process must also be decided and announced upfront. How often will the appraisal happen, what points will the employee be appraised against, what will be the outcome of different appraisal ratings etc., must be clearly communicated. This is also a period when formal feedback on ways of working and areas of improvement can be provided to the employee.

It can be seen that all of the above processes help provide better clarity to the management team in terms of identifying the right person for each role and also clarity to the employees in terms of what is expected of them and what actions will get rewarded. Such clarity helps in maintaining high morale in the team and encourages high levels of performance and promoted high level performers. Here is a video discussing managing remote teams – very relevant to NGOs  
<<https://www.youtube.com/watch?v=rb3LhwPr7P4>>

### **Stakeholder Management**

Stakeholders are all the persons who have an interest in the project. This can include the beneficiaries, the local government bodies, the donors, other projects or organizations that are involved in similar work etc. Thus, we can see that while the donor may be paying the money for the project, there are several groups who are interested in the project.

The project should identify the different stakeholder groups at the beginning of the project. This exercise is useful in ensuring that all major decisions are taken keeping in mind these different stakeholders. Once can see easily that such a decision-making process will help in avoiding conflicts later in the project.

Once the stakeholders are identified, their interests and concerns should be listed. This again feeds into the information that is provided to them on a periodic basis helping in creating a smooth relationship. The communication strategy towards each stakeholder is built around this.

Self-test question - Who are the stakeholders for the current training program me?

### **Information Management**

Data that is organized in a meaningful manner becomes information. Information is a crucial input into all decision-making activities. For example, it would be difficult to take a decision on whether to give an increment to an employee if the information about his or her past performance is not available.

As a first step, various types of information that is required for implementing various activities and for monitoring them should be identified and noted. Then the sources for this information need to be identified. Who will provide this information, in what frequency and in what formats? Who will make use of this information and for what?

It is very important that all the project team members understand why a piece of information is being collected and how it will be used. This helps in two ways; one, it gives an idea about the importance of the information to the person who is asked to collect it. Two, it also helps weed out the collection of unnecessary bits of information that no one uses.

This video deals with using information systems in the NGO management space

<https://www.youtube.com/watch?v=sNNZ0iZ64OU>

As a last step in this process, the user of the information should necessarily provide feedback on the results from the analysis of the information collected to all the people involved in its' collection. This is necessary to ensure proper use of the information and also for the people collecting the information to benefit from its' analysis.

### **Risk Management**

As they say, 'man proposes and God disposes. Things do not go always as planned. However, an intelligent planner will always spend some time and energy anticipating the risks associated with the project. A risk is any event that threatens the success of the project. For a risk to be considered, it should either have a reasonably high chance of occurring and/ or it should be a low probability event but with a high level of impact.

Here is a video discussing risk management in projects

<https://www.youtube.com/watch?v=D3S6kpBIDbk>

Once a risk is identified, the project management team has two alternatives. Either they can create a plan to mitigate and reduce the risk, or they can create a back-up plan for achieving the success of the project using alternatives that are not affected by the occurrence of the risk event. For high impact events that can seriously affect the viability and success of the project, the project management team should plan for risk mitigation as well as back-up options or what is popularly called Plan B.

We learnt how the various elements involved in a project can be brought together under the paradigm of project management, designed specifically for NGOs.

#### **To Do Activity**

Assume that you are working with a NGO and have been given a project related to rural health and hygiene. How will you go about it? Design the entire project management proposal keeping in view the govt. rules and regulations applicable for NGO. Also take care of finance requirements.

Describe the significance of project management in planning, execution and follow-up of a project. Compare the on-site and off-site components of a project through a PM lens. Attempt to connect these with each other.

### **4.5 Project Life Cycle**

This section discusses describes the project life cycle and also highlights the importance of every phase in the project.

#### **Initiation**

This phase consists of all the activities before the project is actually started. This includes creating the proposal, bidding, negotiation ending with signing the contract. This phase needs to be done with due seriousness since not only does it result in the award of the project, but it is also the phase where the terms of the project are agreed to. The project manager or owner should only agree to those terms that they are confident of adhering to.

#### **Planning**

Once the project has been awarded, the task of planning starts. All the components we have seen earlier in terms of enablers and facilitators are now defined and planned. The scope is defined, the schedule made, the budget set, quality agreed. The procurement procedures are put in place, the team planning is done, stakeholders are identified, information needs are assessed and the risk mitigation plan put in place.

Setting goals that are specific, measurable, attainable, realistic and timely is key in this phase.



**Figure 4.12 Phases of Project Management**

Source Demystifying the 5 Phases of Project Management – smartsheet.com



As the old saying goes, if you have 10 hours to cut a tree, spend 9 hours sharpening your axe. Similarly, a time spent on planning is well spent. It will ensure that the project is well thought out. It reduces the chances of problems, conflicts and issues in the future and increases the chances of success.

### **Implementation**

The action starts with the implementation of the project. This is where all the planning comes together. The phase starts with staffing and training. Staff members are recruited as per the role description and trainings are imparted. Once the staff are trained, field activities are initiated as per the schedule alongside initiation of the procurement for materials.

While the implementation happens, monitoring should also be done to ensure that the activities are undertaken within the budget allotted, while producing the outputs according to the quality agreed. Reports and communications as per the plan should go out to the various stakeholders.

### **Monitoring**

Monitoring is at the heart of project management. This is the critical tool used by the project manager to ensure that once implementation starts, things are going according to plan and that the project objectives and the goal would be achieved. Based on the information management system put in place, reports are used to monitor the

- progress of the project against schedule
- quality of output against the agreed standards
- under or over spend against budget for the actual level of activity

Any deviations are analyzed to understand the reasons behind them. Deviations could be due to external circumstances, due to improper implementation of attitudinal issues of staff. Corrective measures need to be promptly taken by the project management team. These can range from feedback and counselling to the staff, re-training, or considering a change in the schedule or budget based on discussions with stakeholders.

- Monitoring may also take the form of external verifications. For example, external auditors can audit the books of accounts, project officers from donor agency can visit and review the progress.
- Monitoring also provides the necessary inputs, along with the information management systems for communications with various stakeholders.

### **Adapting**

While intelligent planning can go a long way in helping the project achieve its' objectives and goal, no amount of planning can consider all possible future circumstances. There can be issues or constraints that were not anticipated at the planning stage. These will get revealed as variations from the plan become apparent during monitoring. Where such constraints are revealed, the project management team should discuss with the stakeholders and alter the plan in order to reflect the realities with the objective of achieving the goal of the project.

### **Feedback Loop**

Feedback loops basically take information about variances after the monitoring stage and use it as inputs into planning. In the earlier subsection of adapting, we have looked at a scenario where there are project planning or design issues. Certain constraints or environmental circumstances may not have been considered or may have undergone substantial changes (like the introduction of a new law affecting the space we are working in). Such cases have to be dealt with in the manner described under adaptation as a revision to the plan in consultation with the various stakeholder groups.

Feedback loop can also reveal flaws in implementation. These are cases where the project planning is fine, but the implementation is not achieving the desired results. Information from monitoring needs to be considered and analyzed further. In many cases, the employee who is responsible for the related activities may need to be re-trained and this will help resolve the issue. Sometimes, it may be so that the employee is not suitable for the particular role. In such cases, he or she needs to be transferred into other opportunities that are more suitable for him or her and recruitment should take place without delay to fill the gap. In cases of attitudinal issues, it becomes clear that the employee is not interested in producing the agreed outputs despite being provided training and retraining and counselling. In these cases, the extreme step of letting the employee go is taken in the interests of the project.

### **Closure**

At the end of the project period, the project draws to a close. If it has been managed well and things have gone as per plan or revised plans or even Plan B, the goal of the project should have been achieved and the project can be wound up. In case the goal has not been achieved yet at the end of the pre-determined period of the project, but the progress has been substantial, the project management team can discuss with the donor and stakeholders for an extension of the project period. This may be granted with cost or on a no-cost basis. Where cost is provided, the donor supports by giving additional time and additional funding. Where the extension is on a no-cost basis, the donor agrees to provide additional time to complete the project while utilizing the remainder portion of the earlier budget.

Proper and formal closure is an important exercise and should cover the following –

- Achievements and learning from the project should be documented and shared
- Financial closure reports should be made and authenticated by the auditors
- Documentation of best practices should be done and disseminated
- All records and financial documents, hard and soft copies should be moved to safe storage. Most donors require that the records be maintained for 5 to 8 years
- Any assets procured by the project from the project budget should be disposed of in a manner agreed to with the donor

### **Impact Assessment**

Integration of project and its impact assessment is one of the most important ways in which an NGO manages its operation. NGO's often have pressures from the funding agencies to explain their working and operation. Many NGO's use RCT's for this purpose. Many NGO's suffer at this end due to lack of expertise and funds. Generally overall assessment of an NGO is not in practice but assessment of one or the other project is frequently carried out by an expert.

We learnt about the elements involved in the various phases in a project's life cycle. We also looked at how impact assessment mechanisms are usually built into the project framework itself.

#### **To Do Activity**

Assume that you are working with a NGO and have been given a project related to rural health and hygiene. How will you go about it? Design the entire project management proposal keeping in view the govt. rules and regulations applicable for NGO. Also take care of finance requirements.

## Model Questions

1. Describe the significance of a grievance protocol in an NGO
2. Evaluate the statement “selecting the right candidate is even more valued in an NGO as compared to for-profit organizations”.
3. How you think book keeping and bank reconciliation helps with financial resource management in an NGO? How is this related with its fund management?
4. Describe the major elements of fund management as per an NGO stand point of operations
5. How would you relate the budgeting process in an NGO to its projects in the field?
6. Describe the significance of planning for the project life-cycle in a project management lens.
7. Elaborate how a project can be run through initiation to closure and follow up.

## Suggested Readings

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# Chapter 5 Corporate Social Responsibility

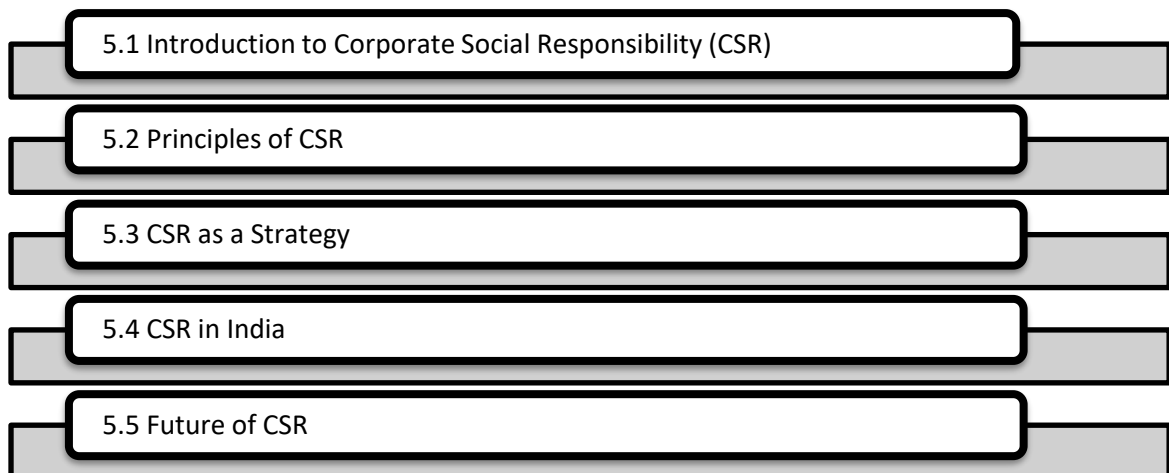
## Introduction

This section introduces to the concept of corporate social responsibility (CSR). Since an organization operates in an environment that takes up the resources from the society, it understands its role in paying back to the society.

## Objectives

- To gain a basic understanding the concept of Corporate Social Responsibility, its underlying philosophies, and significance.
- To gain insights on principles, theories, and various models of CSR
- To understand why CSR is significant as a strategy to your organization in the current times
- To review and understand the historical backgrounds and evolution of CSR philosophy in the Indian context.
- To gain an insight into the different approaches adopted towards CSR and also the road ahead for the companies indulging into CSR.

## Structure



## 5.1 Corporate Social Responsibility

The term ‘corporate’ is generally used to refer to large profit-making organizations that operate and exist as a part of the society and have a sense of responsibility towards the society. Since an organization operates in an environment that takes up the resources from the society, it understands its role in paying back to the society. This entire notion is what we formally address as “corporate social responsibility”. (NPTEL & Malik, 2017).

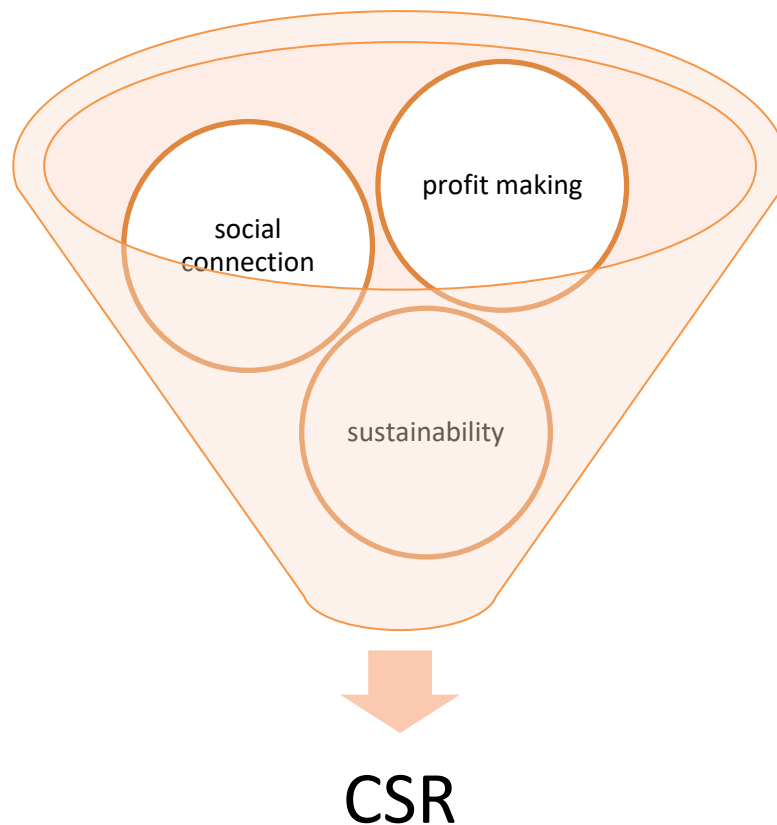
“CSR is about how companies manage the business processes to produce an overall positive impact on society.” (Baker, 2004)

The World Business Council for Sustainable Development in its publication Making Good Business Sense used the following definition.

“Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large”. (Holme & Watts, 2001)

There are three components of corporate a social responsibility(NPTEL & Malik, 2017). These are listed below

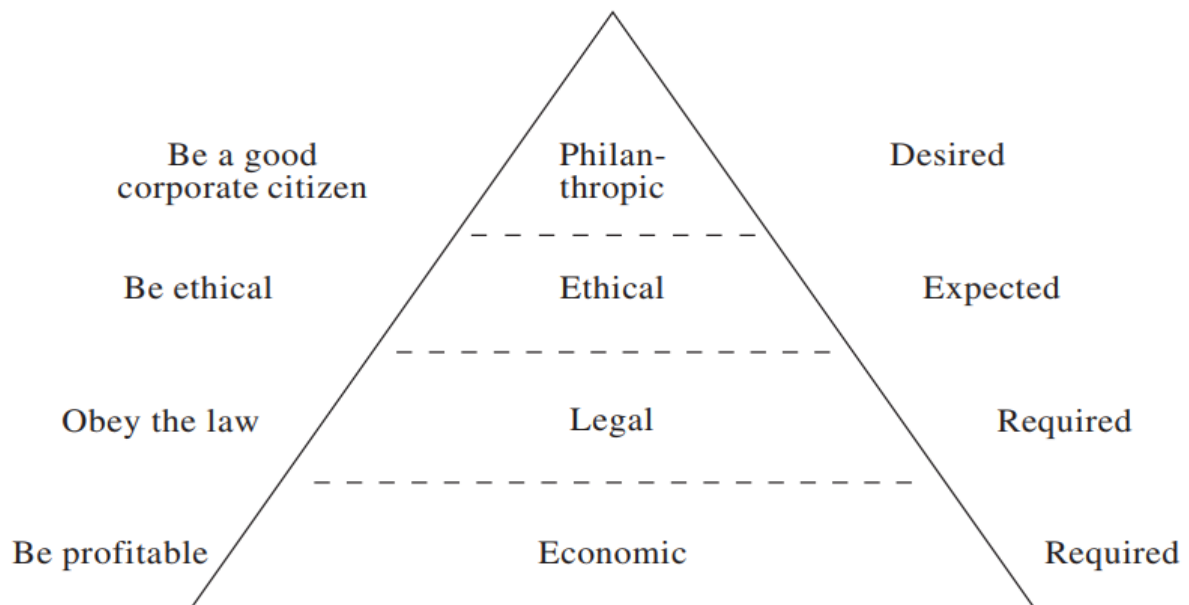
- corporate profit making,
- social connection with the environment in which the organization functions.
- responsibility to sustain the environment.



**Figure 5.1 Elements of CSR**

### **CSR Pyramid**

CSR pyramid was developed by Carroll. Also known as Carroll’s CSR pyramid, it illustrates the different types of obligations that society expects of businesses, through its different layers. In other words, it is a framework describing the need and the ways in which the organizations strive to keep their operations sustainable in all the aspects, vis-a-vis, socially, environmentally and economically. A CSR pyramid is given below.



**Figure 5.2 CSR Pyramid**

Source (Carroll A. , 1991)

The CSR model describes the profits as the base of the pyramid, which further extends towards fulfilment of other obligations as to legal procedures, social norms etc. The hierarchy of the pyramid states that only after the basic needs are fulfilled, the organizations will proceed towards fulfilling their philanthropic interests. A brief description of these components of CSR pyramid is given below

- Economic Deals with the profits of the business
- Legal Deals with the Laws and regulations
- Ethical Deals with the ethics and moral practices followed by the business and also the integrity of its stakeholders
- Philanthropic Deals with the moral responsibility of the business towards the society at large in which it operates.

## 5.2 History and Evolution of CSR

“The historical evolution of the concept CSR can be divided into six phases from early 1950s to 2000s

- 1950-1960s—Period of Introduction of CSR in the academic arena and corporate philanthropy as CSR.
- 1970s—Period of rapid growth in the concept of CSR.
- 1980s—Period of Stakeholder Theory and Business Ethics.
- 1990s—Period of CSR Practicing by Corporate.
- 2000 onwards—Period of empirical works to investigate the determinants and consequences of CSR on corporate strategy” (Bhaduri & Selarka, 2016).

Frederick opinions out three core ideas of trusteeship and corporate philanthropy

- Corporate managers as public trustees.
- Balance of competing claims to corporate resources.
- The acceptance of philanthropy as a manifestation of business support of good causes.



following figure delineates the development of different CSR concepts over a period of time.

Development of CSR concepts			
Period	Name of Concept	Description	Literature
1950s-1960	Social Responsibility of businessmen	The obligations of businessmen to pursue policies, to make decisions or to follow lines of action which are desirable in terms of the objectives and values of society Some socially responsible business decisions can be justified by the long-run economic gain of the firm, thus paying back for its socially responsible behavior. Private contribution to society's economic and human resources and a willingness on the part of business to see that those resources were utilized for broad social ends.	Bowen (1953)  Davis (1960)  Frederick (1960)
1960s-1970s	Stakeholder Approach  Three Dimensional Model	Instead of striving only for larger returns to its shareholders, a responsible enterprise takes into account the interests of employees, suppliers, dealers, local communities and the nation as a whole. The concept consists of corporate responsibilities (i.e., economic, legal, ethical and philanthropic), social issues of business (e.g., labor standards, human rights, environment protection and anticorruption) and corporate actions (e.g., reactive, defensive, accommodative and proactive).	Johnson (1971)  Carroll (1979)
1980s-1990s	Three-dimensional model of principles, policies and processes  Institutional Framework and extended corporate actions	Integration of the principles of corporate responsibility, the policies of social issue management and the process of action into an evolving system. Four types of corporate responsibilities (i.e., economic, legal, ethical and philanthropic) were linked to three institutional levels (i.e., legal, organizational and individual), while corporate actions are extended to assessment, stockholder management and implementation management.	Wartick and Cochran (1985)  Wood (1991)
2000s	Three-domains approach  New Concept	Three domains of corporate responsibilities: economic, legal and ethical. A process to integrate social, environmental, ethical, human rights and consumer concerns into business operations and core strategy in close corporation with the stakeholders.	Schwartz and Carroll (2003)  European Commission (2011)

**Figure 5.3 Development of CSR Concepts**

Source (Jhawar & Gupta, 2017)

We learnt about the multi-level significance of CSR to businesses as well as the local community and environment. We also glanced through the historical evolution of CSR.

**To Do Activity**

Study the CSR programs taken up by any two companies of your choice. Eg. TATA, ITC. Do you think the activities taken up by them have a noble cause and based on your study of these companies draft a set of activities you can take up as a part of the company in which you are placed?

## 5.2 Principles of CSR

This unit introduces to the key principles of CSR. It also discusses the various theories that lay down the guiding principles for implementing the CSR. Towards the end of the unit, we also describe the different models of CSR that have evolved over a period of time.

### Principles of CSR

CSR has become a vital component for almost every business today. It has been made mandatory by the Government to contribute towards the CSR activities and hence, slowly the concept has gained momentum. The CSR activities are also therefore governed by certain rules and regulations, which we term as principles of CSR. The key principles of CSR are described below

- Developing structures, practices and procedures so as to ensure ethical conduct of activities.
- Maintaining transparency in the corporate communications so as to ensure the informed decision making by the concerned stakeholders.
- Refrain from engaging in corrupt practices
- Following the mandatory disclosure norms so as to discharge the financial responsibility as well
- Following the adequate reporting practices
- Ensuring that there is no violation of conduct on the part of the company for any third-party transaction

### Philanthrocapitalism

The term philanthrocapitalism is used to refer to the way of conducting a business in which there is integration of venture philanthropy wherein specific social programs are pursued in order to yield return on investment in the long term as well as the passive form involving social investors who tend to seek benefit from the socially responsible programs.

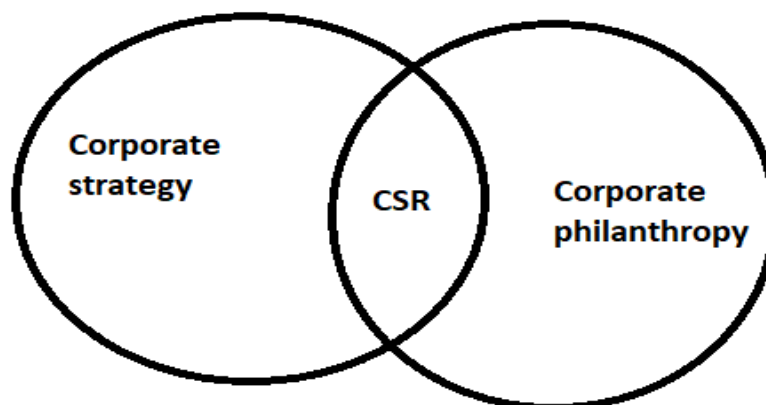


Figure 5.4 - Scope of CSR

### Theories of CSR

The following section describes the various theories of CSR. Let's take them one by one  
Corporate Social Responsibility (CSR)

'Corporate social responsibility' has two meanings. First, it's a general name for any theory of the corporation that emphasizes both the responsibility to make money and the responsibility to interact ethically with the surrounding community. Second, corporate social responsibility is also a

specific conception of that responsibility to profit while playing a role in broader questions of community welfare.

As a specific theory of the way corporations interact with the surrounding community and larger world, corporate social responsibility (CSR) is composed of four obligations

- Economic responsibility.
- Legal responsibility
- Ethical responsibility
- Philanthropic responsibility

Taken in order from top to bottom, these four obligations are decreasingly pressing within the theory of corporate social responsibility. As a hierarchy, the logic behind this ranking works easily. For example, a law firm on the verge of going broke probably doesn't need to feel the responsibility to open up for school visits, at least not if the tours interfere with the accumulation of billable hours and revenue. Obviously, if the firm does go broke and out of business, there won't be any school visits in any case, so faced with financial hardship, lawyers are clearly obligated to fulfil their economic obligations before philanthropic ones.

More difficult questions arise when the economic responsibility conflicts with the legal one. But, at the time of the decision, there may have been less certainty about exactly what the risks and benefits were. Even among individuals promoting a strong sense of corporate responsibility for the surrounding community, there may have been no clear answer to the question about the proper course of action. Regardless, corporate social responsibility means every business holds four kinds of obligations and should respond to them in order first the economic, then the legal, next the ethical, and finally the philanthropic.

### **Triple Bottom Line Approach**

Also known as TBL or 3BL, this approach proposes a three-level framework that includes social, environment and financial components. This framework proposes to use these three areas to evaluate the performance and hence create business value by adopting this broader perspective. This theory clear cut indicates the sustainability to represent the intersection of ethics and economics, thereby featuring the long-term maintenance of balance. As elaborated by theorists including John Elkington, here's how the balance is defined and achieved economically, socially, and environmentally

- Economic sustainability (long-term financial solidity over more volatile, short-term profits, no matter how high).
- Social sustainability (balance in people's lives and the way we live)
- Environmental sustainability (Optimum utilization of scarce resources)

Together, these three notions of sustainability—economic, social, and environmental—help the businesses strive toward Sustainability.

## Legitimacy Theory

Legitimacy Theory highlights the degree to which corporate disclosures, both social and environmental are affected by the boundaries that are established by the society so as to be valued and avoid being penalized by the community in which the company operates. (IGI Global, 2019)

The different ways that are adopted by the companies to legitimate their activities are described below

- Reporting - Educating the relevant stakeholders about their actual performance.
- Public impression management - Changing the perceptions of the relevant stakeholders about the fundamental problem without altering the organization's behavior.
- CSR Activities and advertising - Distracting the attention away from the subject of concern and seek to divert the attention to a favorable issue.
- Brand management- Seek to change external expectations about the organization's performance.

## Stakeholder Theory

This theory is a blend of organizational management and business ethics. This theory addresses the values and morals that are required while managing an organization. It integrates both market-based view as well as the resource-based view and further takes it to a socio-political level. The following figure illustrates the theory with its relevant areas.

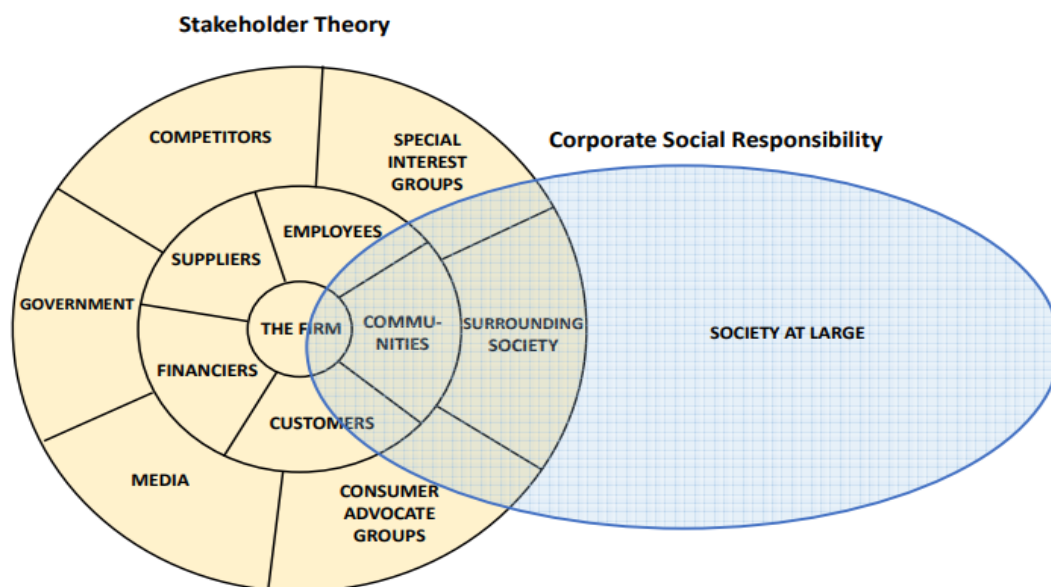


Figure 5.5 - Relation between Stakeholder Theory and CSR

Source (Freeman & Dmytriiev, 2017)

## Models of CSR

### Traditional Conflict Model

This model lays emphasis on the conflicting role of CSR with the traditional profit-making objective of the company.

### **Added Value Model**

It proposes social and environmental commitments as a means to increase profit. This model focuses on issues such as value of CSR in finding socially conscious employees, attracting socially conscious consumers and managing the risks of negative press.

### **Multiple Goals Model**

This model lays stress on the importance of social values in corporate decisions that are untethered to economic values. This states that the corporations have goals that are beyond shareholder value, and include the activities for enhancing the welfare of the community without respect to financial advantage. Here is an article that speaks of how CSR can be deployed through social entrepreneurship initiatives.

We went through the guiding principles, philosophies, theories as well as some major models of CSR,

#### **To Do Activity**

Based on your study and understanding of the principles of CSR analyses the CSR activity taken up by Starbucks and HZL. Do you find the initiative taken up by the companies justified with reference to the objectives of CSR?

and also explored the relatively new-fangled concept of philanthrocapitalism.

### **5.3 CSR as a Strategy**

This section describes the strategic role of CRS. Understanding the role, a company plays in the localities and communities that it serves is vital to determine the impacts its operations have on the environment. Among its stakeholders, the communities and localities in which they function is also a party whose goodwill and well-being the company should strive to ensure.

#### **Strategic Corporate Philanthropy**

Business entities need to play a strategic and constitutive role in attempts to address the most pressing issues faced by our local, national and global communities. Society has increasingly been mandating that for-profit organizations also engage in contributions to social purposes. It is important for an organization to demonstrate to the larger society how it makes a beneficial contribution to society.

Understanding the role, a company plays in the localities and communities that it serves is vital to determine the impacts its operations have on the environment. Among its stakeholders, the communities and localities in which they function is also a party whose goodwill and well-being the company should strive to ensure. This in turn helps in identifying management strategies so as to minimize the harm caused directly due to the company's operations. For example, creating a diverse workforce sourced out of the local population, providing retirement planning training early in their career to prepare the staff and workforce for retirement, etc. are all ways of giving back to the society which enables the company to operate and meet its objectives.

“Society is demanding that companies, both public and private, serve a social purpose. To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society. Companies must benefit all of their stakeholders, including shareholders, employees, customers, and the communities in which they operate.” (DeBoskey, 2018)

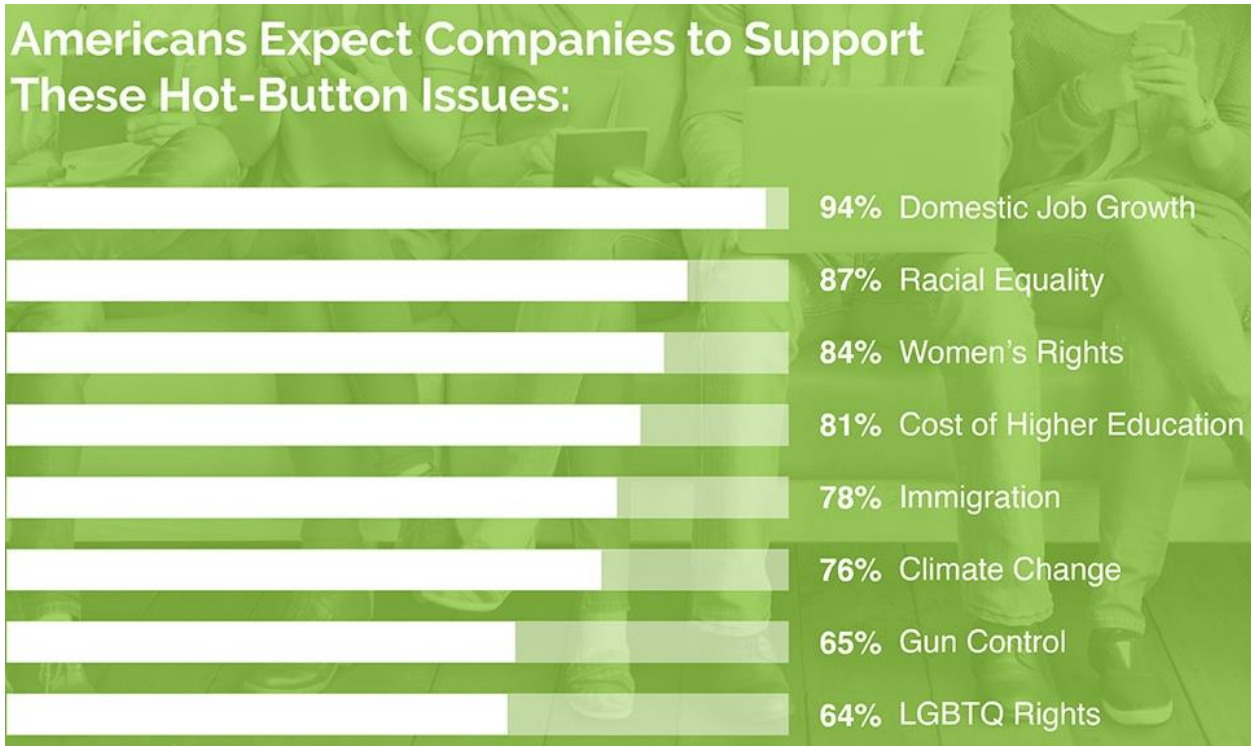
– Larry Fink (Chairman and CEO, BlackRock).

According to 2017 Cone Communications CSR Study in the USA, “78% of consumers want companies to address important social justice issues. 87% will purchase a product because a company advocated for an issue they cared about” and, conversely, “76% will refuse to purchase a company’s products or services upon learning it supported an issue contrary to their beliefs” (Cone Communications, 2017). The 2016 Cone Communications Millennial Employee Engagement Study in the USA found that “83% (consumers) would be more loyal to a company that helps them contribute to social and environmental issues” and “88% say their job is more fulfilling when they are provided opportunities to make a positive impact on social and environmental issue” (Cone Communications, 2016).

Even presenting employees with opportunities to engage in in social, environmental and other sustainable causes are beginning to be seen as effective strategies to expand and diversify employee skills to meet unique requirements of work in an ever-changing globalized world. For example, employees who serve as members in non-profit boards, especially as their company’s representatives enhance value at the workplace by helping promote diversity as well as inclusion goals of their employer. This experience has also been found to bring about positive changes in the communities where they live and work.



**Figure 5.6 - Impacts of Sustainability Initiative Experience to Employees**

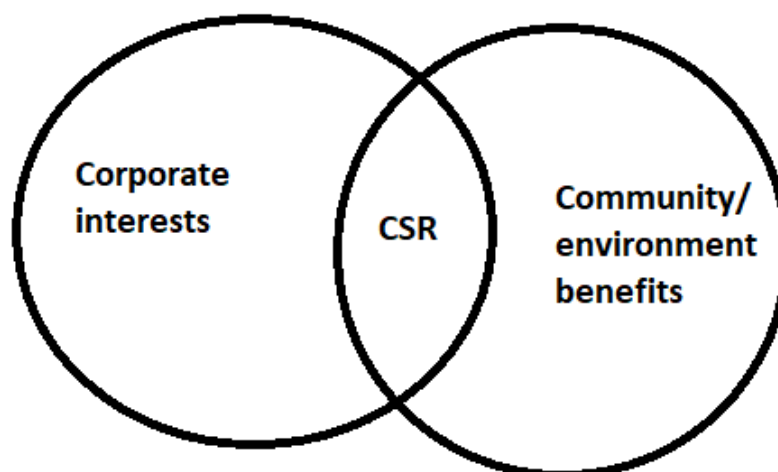


**Figure 5.7 - Impact of CSR on Consumer Decisions**

Source (Cone Communications, 2017)

Strategic Corporate Philanthropy has increasingly been gaining momentum as a critical component of attracting customers, irrespective of the size of the company, the beneficiaries, or the involvement. Businesses increasingly recognize that their reputation as a responsible corporate citizen actually boosts their prospects in recruiting, engaging and retaining employees. It also helps forge healthier relationships with vendors and regulators, fulfil investors' motives and deepen ties with clients.

In today's ruthlessly competitive and rapidly fluctuating business environmental conditions, corporate philanthropy, without doubt is a critical component of business. It must be "strategic and part of a company's DNA – and so much more than random acts of kindness". (DeBoskey, 2018).



**Figure 5.8 - Scope of CSR**



### **Corporate Citizenship**

Corporate citizenship refers to the state when a company exhibits commitment to ethical and moral values by balancing stakeholders' needs while still upholding protection of the environment. The difference between CSR and corporate citizenship remains that there is a sharper focus on employee rights, environment, and education with the latter. To illustrate with an example, Microsoft recently won 'Corporate Citizenship Company of the Year' award for their efforts with 'Making Cents International', an organization that helps with education and coaching of global youth.

### **Corporate Social Performance**

"Corporate social performance (CSP) refers to the principles, practices, and outcomes of businesses' relationships with people, organizations, institutions, communities, societies, and the earth, in terms of the deliberate actions of businesses toward these stakeholders as well as the unintended externalities of business activity". It is defined as "a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships"(Wood, 1991).

Corporate social performance refers to the stakeholders' temporal assessment of the CSR and corporate citizenship in comparison with competition. Stakeholders are allowed to evaluate and analyze a company through three variables.

The first component of corporate social performance model is social responsibility, which is comprised of economic, legal, ethical, and philanthropic aspects. Organizations are expected to examine whether they have been victorious in each specific component starting at the bottom of the pyramid economic (since the primary motive of a business is profit).

The second component is the mode of social responsiveness which refers to how receptive a company is to social concerns. A company can choose to be upbeat, accommodative, defensive, or reactive. A socially receptive company will also be proactive. An example for this could be Microsoft's initiative called Youth Spark, which helps young minorities gain experience in technology such as coding.

Social issues of stakeholders is the last element of corporate social performance analysis. This element serves as a pointer to check whether their operations substantially affects adversely the smooth social and cultural life of any stakeholder associated with the company either directly or indirectly." (Wood, 1991).

### **Corporate Social Irresponsibility**

According to Friedman (1970), businesses ought not take social accountability, individuals should. The people working with an establishment have an obligation towards the holders. The article argues to make as large of a return of investment as possible, while still adhering to basic ethical rules and statutory laws. If a person working in a company feels the need to act in a certain socially accountable manner, this needs to be carried out on a personal level, and not based on the identity of the company, since this can be seen as thieving from the proprietors. (Friedman, 1970).

Corporate social irresponsibility (CSI or CSIR) is a concept that has just begun to grow as a theme of concern on the international scene. CSIR can be described as “a decision to accept a choice that is less moral than its alternative” (Murphy & Schlegelmilch, 2013). Murphy and Schlegelmilch (2013) further expand that while companies that have CSI arrangements might not be flouting the law, but are, however, not taking complete accountability as a company. Wagner et al. call CSIR as negative CSR, which is being conveyed to patrons by mass media (Wagner, Bicen, & Hall, 2008). Lin-Hi and Müller (2013) described two kinds of irresponsibility; Intentional CSI denotes corporate acts like bribery and tax evasion, and unintentional CSI denotes detrimental events, such as a cyclone, triggered by external elements. (Lin-Hi & Müller, 2013).

We learnt how CSR can effectively be used as a corporate strategy to gain a competitive edge in the market. We also glimpsed at the relatively recent idea of CSIR and how that too has been argued to be a valid strategy for business enterprises.

#### **To Do Activity**

Assuming that you are the head of the CSR division of an IT company design a CSR strategy for your company keeping in view the primary objective of the company in compatibility with the CSR objectives.

## **5.4 CSR in India**

This section discusses in detail the CSR scenario in India. CSR has been in informal practice since ancient times in the form of charity to the disadvantaged and other people in need. Indian scriptures in many instances mention the pivotal aspects of sharing part of one’s resources with the deprived segments of society. We Indians can feel proud to possess a deep-rooted cultural trait of caring for each other through sharing.

### **A Brief History**

India boasts the world’s richest tradition of Corporate Social Responsibility and perhaps the longest continuous cultural observance of the idea behind the concept. The term CSR may be relatively new to India, but the concept of for-profit ventures giving back to the society and environment dates back to Mauryan history, where philosophers like Kaushalya underscored the relevance of ethical practices and values while going about with business activities. CSR has been in informal practice since ancient times in the form of charity to the disadvantaged and other people in need. Indian scriptures in many instances mention the pivotal aspects of sharing part of one’s resources with the deprived segments of society. We Indians can feel proud to possess a deep-rooted cultural trait of caring for each other through sharing.

Philanthropy in India for the most part has always been associated with religious institutions. In the socio-cultural setting of a hierarchical caste-based system of segregation dating from the Vedic ages, religio-cultural traditions of Dan and Sava, and later the Zakat following the entry of Islam, functioned in India for centuries serving to shape the affiliation between the privileged and the ritually and otherwise cast out. Religion have also played a sizeable role in endorsing the concept of CSR. Islam has a mandate called Zakat, which stipulates that a share of one’s income must be shared with the less privileged as donations. Traders belonging to the Hindu cultural faith believed in giving

alms, contributed to get temples built and night shelters set-up for the disadvantaged sections of society. Hindus followed the notion of Dharmada where the producer or seller levied a certain amount from the buyer, which was meant to be utilized for charity. In similar terms, the Sikhs follow Daashaant.

Some of the first industrialists of the 19th Century such as Jamshed Tata initiated the culture of corporate donations via trusts, and endowed institutions managed by members of (often their own or a relative's) business families. A new leg of corporate philanthropy emerged after the First World War when Mahatma Gandhi proposed a model of trusteeship for business in which businessmen should comprehend their position as trustees of society's wealth.

In the period immediately following Independence, the role of the Indian State extended significantly and the corporate sector occupied a backseat in development efforts. In the course of time, failures of the State to put an end to poverty and to support economic advancement led to discontentment. The liberalization of the Indian economy in 1991 steered in a new globalized economic playground characterized by rapid rise in overall wealth as well as in social inequality. The widening gap between the most affluent Indians and those at the nethermost kindled innovation in efforts by the corporate class to begin addressing social issues. In the context of a dwindling State, an extensively globalized economy, and wide segregations in economic and social worlds, the landscape of Indian CSR is captivating to say the very least.

<b>Time period</b>	<b>Economic currents</b>	<b>State role</b>	<b>Corporate CSR</b>
<b>1850-1914</b>	Industrialisation	Colonial, extraction	Dynastic charity
<b>1914-1947</b>	Trade barriers for new industries	Colonial, exploitative	Support freedom struggle
<b>1947-1960</b>	Socialism, protectionism	Five year plans	Support new state; launch own rural initiatives
<b>1960-1990</b>	Heavy regulations	Licence raj; development failures	Corporate trusts
<b>1991-2013</b>	Liberalisation	Shrinking in production; expanding in social provision	Family trusts, private-public partnerships, NGO sponsorship
<b>2013-present</b>	Globalisation	Need to manage inequality; new reforms to liberalise further	Introduction of mandatory 2% rule

**Figure 5.9 – History of CSR in India**

Source (Deo, 2015)

It is evident from the above figure that the history of CSR in India is temporally relatable to the historical development of India. CSR has advanced in phases such as community engagement, socially accountable production and consumption, and socially accountable workforce-relations. Hence, the documented history of Corporate Social responsibility in India can be broadly grouped into four distinct phases.

The first chapter of modern CSR in India was fueled by the noble deeds of philanthropists and layman's charity. Influenced by family-centered values, traditions, indigenous culture and religion, it adapted in due time to the evolved needs of society after industrialization. The period up to roughly around 1850 saw the wealthy tycoons sharing their prosperity with the wider society by either building temples or other physical structures that provided shelter to people from all walks of life, especially the lower strata. They were known to release the provisions deposited in their granaries for the destitute and hungry during times of famine and shortage. With the onset of British colonial rule in 1850, their strategy towards CSR underwent a major shift.

In the pre-independence era, the forerunners of industrialization also buttressed the concept of CSR. The 1900s saw industrialist families like Tatas, Birla's, Godrej, Bajaj's and Singhanias endorse this notion by setting up altruistic foundations that served the society by imparting modern education and healthcare, and also set-up trusts for community development. On a different note, it is also to be marked that these efforts for social assistance were also motivated by political ambitions.

The second phase involves the beginning stages of the Indian freedom struggle when the business tycoons were called to display their true commitment to the nation. Mahatma Gandhi urged the influential industrialists to share part of their wealth towards the benefit of underprivileged sections of the society. The concept of trusteeship contributed by him aided with the country's socio-economic growth. He influenced the large-scale entrepreneurs and business houses to set-up trusts for research, educational and training institutes. These trusts also helped bring about social reforms like rural development, women empowerment and spread of education.

In the third phase from 1960-1980, CSR practice was widely influenced by the emergence of Public sector undertakings that also helped ensure a more even distribution of wealth. The administrative policies of industrial licensing, high taxes and restrictions on the private sector played their parts in giving rise to incorporate malpractices. This in turn led to enactment of legislation concerning corporate governance, labor and environmental matters. However, the PSUs in general were not very successful. Hence, there was a natural swing of expectations from the public to the private sector and their active involvement in the nation's socio-economic growth. In 1965, the academicians, politicians and businessmen of the country converged on a national workshop on CSR, where great emphasis was laid on social responsibility and transparency.

In the fourth phase from 1980 onwards, Indian companies infused CSR into a sustainable business strategy that centered around the notion of 'giving back to the society'. With globalization and economic liberalization in the 1990s, and partial easing of controls and licensing structures, there was a spike in the country's economic growth. This in turn led to the boosted momentum in industrial growth, enabling the companies to spend more towards social accountability. Thus, what began as charity is now widely understood and acknowledged as responsibility.

In current India, the Companies Act amended in December 2012 requires the corporate to spend 2% of their average net profits of the last three financial years towards CSR. Subject to qualifying conditions, this Act emphasizes on carrying ahead the agenda of Corporate Social Responsibility. (SoulAce, 2017)

### **Case Study**

The corporate takeover in Kizhakkambalam

“An Indian garment manufacturing company called Kitex has taken over the administration of a small village called Kizhakkambalam by winning the local body elections held in November 2015. Mainstream political leaders and environmental activists feel that this can lead to a dangerous precedent because corporate body can have a hidden agenda in taking over the administration of political bodies. Former Indian MP Sebastian Paul says that “the company was at loggerheads with the former panchayat on issues like environmental pollution so we don’t know what their vested interest is in taking over the panchayat. They also employ a big segment of the population there and also give out dole to locals. This model can be replicated...it is setting a dangerous precedent.” Environmentalists like C. R. Neelakantan point out that the Kitex group has become active in social service only after they were involved in court cases connected with water and land pollution.” (IPFS, 2019)

### **Legislation for CSR – India**

CSR in its current state in India is a result of the 2013, Companies Act. India is in fact one of the few countries to have a dedicated legal Act pertaining to CSR. The Companies Act, 2013, which is a successor to The Companies Act, 1956, made CSR a compulsory provision. As per the notification dated 27.2.2014, CSR has been demarcated in a rather broad style in Schedule VII of Companies Act, 2013. The definition is exhaustive as it includes “those specific CSR activities listed in Schedule VII and other social programmers not listed in schedule VII, whose inclusion as a CSR activity is left to the company’s discretion.” under Section 135 of Schedule VII of the new Act, CSR contribution is mandatory for profit-making companies of all kinds, provided they satisfy any one or more of the below fiscal criteria

Net worth of the business should be  $\geq$  INR 500 crores

Annual turnover of the company should be  $\geq$  INR 1000 crores

Annual net profits of the company should be  $\geq$  INR 5 crores.

Those companies meeting any of these are required to form a committee to implement its CSR mandate, with a minimum of three directors, one of whom is required to be an independent member.

The responsibilities/ powers of the committee will be

Formulation of a detailed action-plan to implement its legally mandated CSR activities that conform to Schedule VII of the Companies Act, 2013

Allocation and audit of funds for different CSR directions

Executive supervision of planned CSR activities

Release of annual report on all undertaken CSR activities during each financial year

Approve the form and format of CSR policies that are to be posted in public on the company’s official website

The board of directors is legally bound to accept and execute any CSR suggestion put forward by the committee.

Assess on a regular basis the net profits made by the company and warrant that at least two percent of it is disbursed on CSR activities.

Warrant that local issues and regional concerns are given preference for inclusion into CSR activities

The specific details of funds utilized for CSR causes are to be included in the profit-loss report of the company which is released annually.

The CSR rules came into effect on 1st April 2014 and blankets subsidiary companies, holdings, and other foreign business entities that are involved in business activities in India. (Kumar, 2018). We

#### **To Do Activity**

Having understood the meaning of corporate sustainability design a series of activities that can be taken up at the institute level to ensure environmental protection at the institute level. Along with the set of activities also explain its implementation successfully.

learnt about the evolution of the Western-originated concept of CSR in India. We also learnt about ideas of present-day CSR as it was incorporated historically into the cultural fabric of India.

### **5.5 Future of CSR**

This section talks about the future scope and opportunities for CSR in India.

A few fields where CSR actually has a lot of space to operate have been identified and discussed in this section.

#### **Socially Stigmatized Industries**

Socially stigmatized industries are those industries that hold a status of promoting offerings that are ideally harmful to a) people; b) planet (including other life forms) and c) certain socio-cultural aspect of human existence.

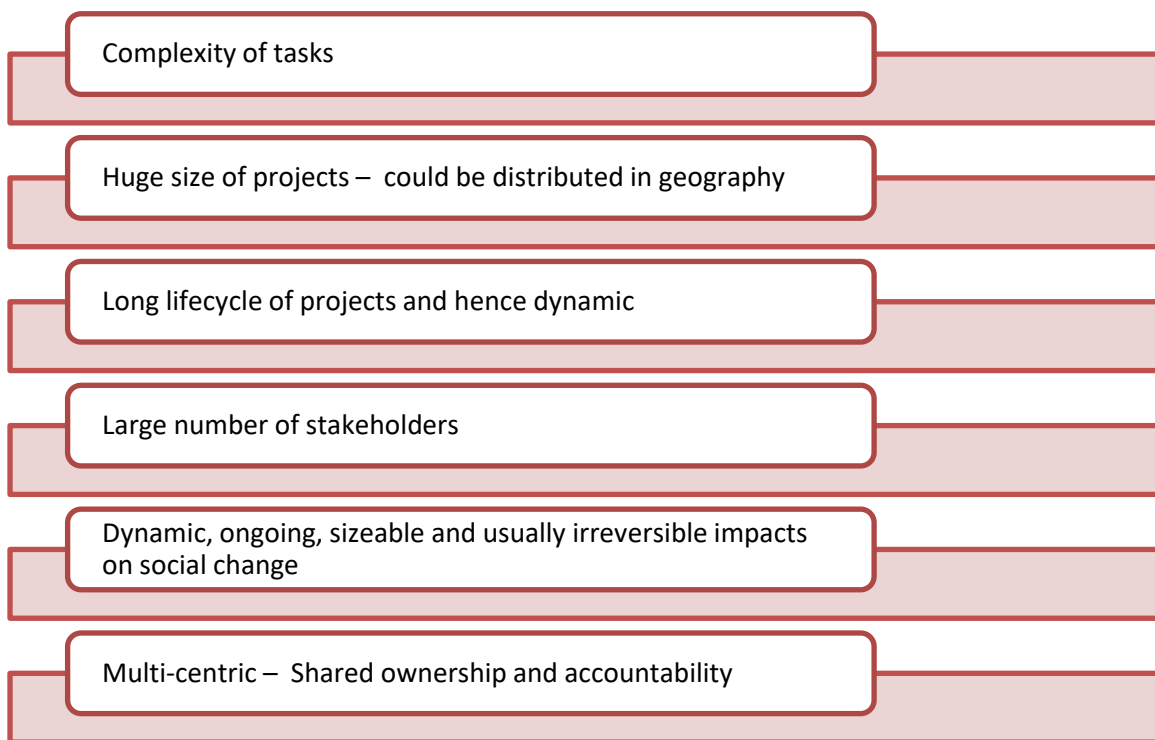
#### **A Recent Case for Socially Stigmatized Firms is given Below**

Indian Tobacco Company (ITC) Choupal ITC has come up with this e-choupal as a more effective supply chain that aims at delivering value to its customers across the globe on a sustainable basis. The e-choupal initiative is through the agribusiness initiative and is one of the successful initiatives that we can talk about.

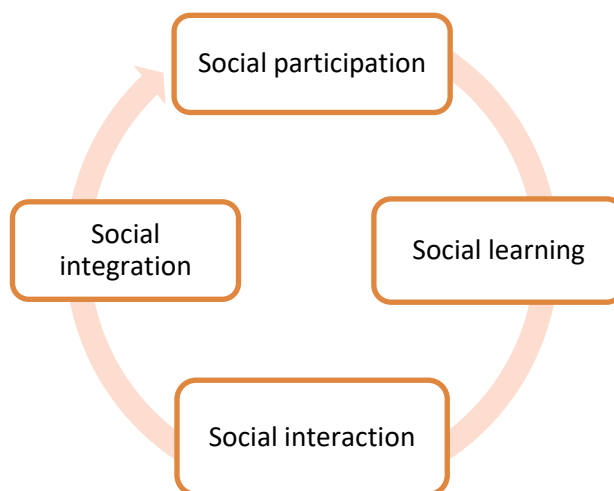
#### **Megaproject Social Responsibility (MSR)**

Mega projects may be defined as the large projects that are spread over long duration may be years or even decades. These include the projects such as construction of dams or roads and construction of flyovers and revamping the national highway or constructing a new national highway or renovating an existing road into a national highway.

The key concern in these projects is the clash between the policies and practices of stakeholders through the whole project lifecycle.



**Figure 5.10 Scope of MSR**



**Figure 5.11 Societal Governance Process of MSR**

**Territorial Social Responsibility**

Territorial social responsibility is a form of governance that represents an integration of CSR and sustainability-oriented strategies and are promoted by networks of local actors, which include, public and private, for and nonprofit (such as institutions, universities, chambers of commerce, trade



union associations, businesses, foundations, banks, nonprofit organizations, professional order etc. ) and all those who are oriented toward sustainable development.

### Sustainopreneurship (Sustainable Entrepreneurship)

The concept of Sustainopreneurship has emerged from the earlier concept’s social entrepreneurship and ecopreneurship, via sustainability entrepreneurship. The concept refers to the use of creative business that organize with the objective of solving problems pertaining to sustainability so as to create social and environmental sustainability.

Dimensions of Sustainopreneurship

find and/or create innovations to solve sustainability-related problems

get solutions to the market through creative organizing

adds sustainability value with respect for life support systems

### Forestry and Nature



Figure 5.12 Scope of CSR in Forestry

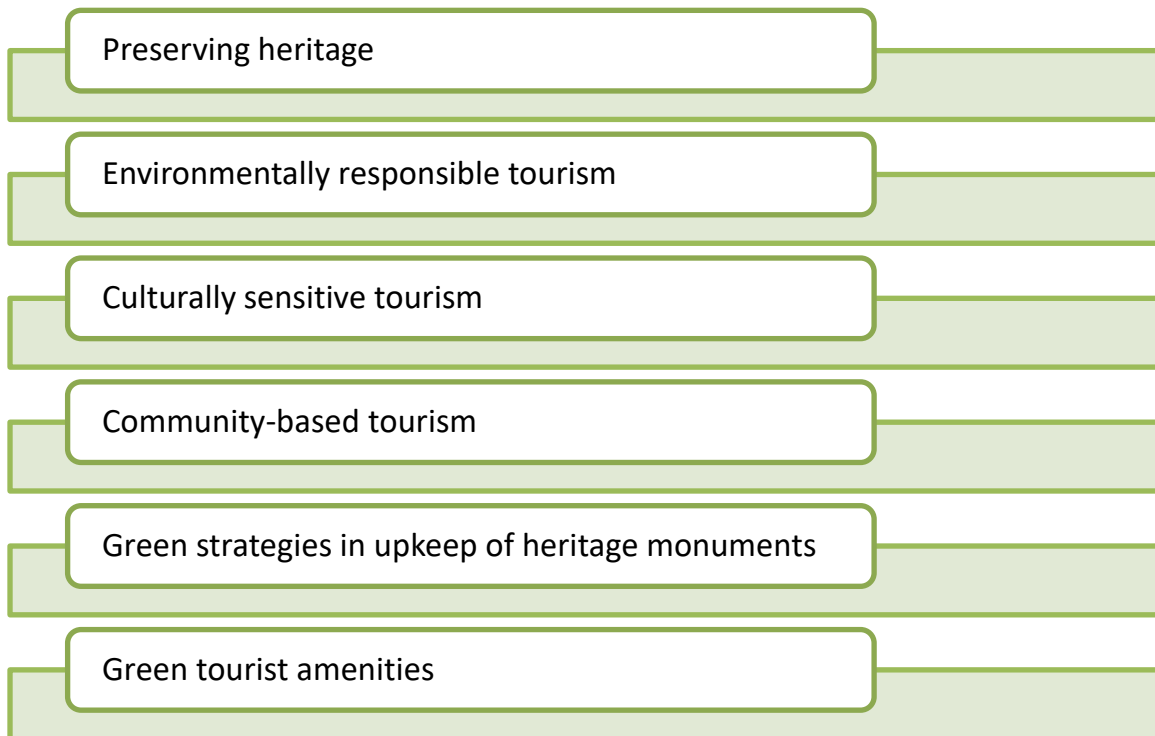
Cyber CSR (cyber security)



Figure 5.13 Cyber CSR

(Source <https://www.kisspng.com/png-computer-security-managed-security-service-informa-1587782/>)

## Heritage and Tourism



**Figure 5.14 Scope of CSR in Heritage and Tourism Industry**

This Section describes the challenges ahead for CSR initiatives in the present-day business environment. The unit talks about the various sectors in which CSR has a long way to go. Particularly, we discussed, Socially Stigmatized Industries, Megaproject Social Responsibility (MSR), Territorial Social Responsibility, Sustainopreneurship (sustainable entrepreneurship), Forestry and Nature, Cyber CSR (cyber security) and Heritage and Tourism.

### **To Do Activity**

Do you think CSR has a positive future in today's rapidly changing world? Do the CSR efforts of the company are really beneficial for the society or mere completion of obligation at the part of the company. Support your answer with examples.

### **Model Questions**

1. How would you describe the significance of CSR in relation to both the business and the local community as well as environment involved?
2. Briefly describe the evolutionary history of CSR in India. In your opinion, when did the idea of need for CSR emerge in India?
3. What according to you will be the next biggest arena for CSR to step into? Justify.
4. How do you think CSR can be deployed in the cyberworld?
5. What is CSIR? Compare the philosophy behind CSIR with that of CSR.

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## **Editors' Profile**

### **Dr W G Prasanna Kumar**

Dr.W. G. Prasanna Kumar, PhD in Education with basic degree in Social Work and Master's Degrees in Sociology, Public Administration and Political Science has professional education in Environmental Economics, Public Relations, Communication and Training and Development. Presently Chairman, Mahatma Gandhi National Council of Rural Education (MGNCRE) under the Ministry of Human Resource Development, in Government of India strives to promote resilient rural India through Higher Education interventions. The national initiative of reviving Mahatma Gandhi's ideas of NaiTalim, spearheaded by Dr. W G Prasanna Kumar, has met unprecedented success at both national and state levels. The primary objective of this initiative is to promote Gandhiji's ideas on Experiential Learning, NaiTalim, Work Education and Community Engagement, and mainstreaming them in School Education and Teacher Education Curriculum & Pedagogy. As Professor and Head Centre for Climate Education and Disaster Management in Dr MCR HRD Institute, conducted several capacity building and action research programmes in climate education, disaster management and crowd management. He has handled many regional, national and international environmental education programmes and events including UN CoP11 to Convention on Biological Diversity and Media Information Management on Environmental Issues.

He was Director in National Green Corps in the State Government for over 11 years and Senior Social Scientist in State Pollution Control Board for 6 years. Conducted various curriculum and non-curriculum related training programmes in environmental education. He was a Resource Person for AP Judicial Academy, AP Police Academy, AP Forest Academy, EPTRI, Commissionerate of Higher Education and Intermediate Education, State Council for Educational Research and Training and National Council for Educational Research and Training New Delhi, CCRT, BharathiyaVidyapeet University Pune, CPR Environmental Education Centre Chennai and Centre for Environment Education Ahmedabad. Dr W G Prasanna Kumar was trained in Community Consultation for Developmental Projects in EPA Victoria Australia in 1997 trained as State Chief Information Officer by IIM Ahmedabad and MCRHRDI Government of Andhra Pradesh in 2004 and trained in Environmental Education and Waste Management Technique by JICA, Japan in 2011.

He was awarded Best State Nodal Officer of National Green Corps Award from Centre for Science and Environment, New Delhi, 2008, Jal Mithra Award from Earthwatch Institute of India and Water Aid New Delhi, 2014 and Certificate of Commendation for the services in UN Conference of Parties to Convention for Biodiversity conducted at Hyderabad from 1-20 October 2012 by the Government of Andhra Pradesh 2012.

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Dr K N Rekha, is a PhD Graduate from IIT Madras. She has 13 years of experience in training and education Industry. She works at Mahatma Gandhi National Council of Rural Education (MGNCRE), Hyderabad as Senior Faculty. She is involved in curriculum development on Rural Management and Waste Management. Prior to this, she worked as a Researcher at Indian School of Business (ISB), Hyderabad, and has a short stint at Centre for Organization Development (COD), Hyderabad. She has Co-authored a book on "Introduction to Mentoring", book chapters, Peer reviewed research papers, book reviews, casestudy, and caselets in the area of HR/OB. She also presented papers in various national and international conferences. Her research areas include Mentoring, Leadership, Change Management, Coaching, 360 Degree Feedback appraisal, etc. She was also invited as a guest speaker at prominent institutions like IIT Hyderabad.

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Ravi Dhanuka is a co-founder of I-Saksham Education And Learning Foundation. i-Saksham builds community edu-leaders to enrich the education experiences of underserved children for their lifelong success in the world ahead. Ravi has served as Prime Minister's Rural Development Fellow (PMRDF) for 3 and half years in Munger, Bihar to assist district administration in the implementation of flagship rural development schemes in extremism affected villages. Prior to joining PMRDF, Ravi worked with BASIX for two years in areas of microfinance, and rural livelihoods. Ravi has done Post Graduate Diploma in Rural Management from Institute of Rural Management, Anand (IRMA). He has Bachelors in Economics (H) from Hans Raj College, Delhi University. At i-Saksham, Ravi is primarily looking after field operations and implementing the i-Saksham model in far-flung areas. He brings with himself a huge passion to contribute to improve the capabilities of marginalized sections of the society. He considers education and values as his biggest assets

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Prof. Prakash Satyavageeswaran's research focuses on sustainable solutions supporting social enterprises and consumers in emerging markets, especially in the bottom of the pyramid. His research projects, co-authored with various researchers, have been supported by several competitive grants totaling over US\$ 50,000. He has worked in the past with Spandana, a Microfinance institution, to promote micro insurance and micro credit in rural India. He has also worked with HLPPT, a national level public health NGO, working on social marketing to promote healthy behaviors among vulnerable populations. His proposal with co-investigators to the Government of India under SPARC to study rural and women entrepreneurship and empowerment has been recently approved.

### **Prof D VR Seshadri**

Since 2000 until joining ISB as Clinical Full Professor of Business in the Marketing Area in July 2016, Prof. D.V.R. Seshadri taught in various IIMs (particularly at Bangalore, Ahmedabad and more recently at Udaipur since 2012). For 15 years prior to 2000, he worked in a variety of companies (public sector, family business and entrepreneurial start-ups, the last ten of them as CEO spanning a variety of industries (petroleum refining & petro-chemicals, bulk drugs, active pharmaceutical ingredients, precision manufacturing and software). His areas of interest among others include: Strategy, B2B Marketing, Innovation; Entrepreneurship & Intrapreneurship and Leadership. He is actively involved with several NGOs such as Aravind Eye Care Systems, Madurai and DHAN Foundation, Madurai in addition to engaging with several top corporates such as companies of the Tata Group and L&T. He has been engaged in teaching / consulting capacity with over 100 large corporates, both India-based and foreign MNCs. He has taught a variety of courses / programs in MBA, executive MBA, long duration programs in public policy, short duration executive education programs, etc. He has co-authored several books: 'Innovation Management,' with ShlomoMaital, Sage India in 2007; 'Global Risk / Global Opportunity,' with ShlomoMaital, Sage India, in June 2010; the Indian adaptation of 'Business Market Management (B2B): Understanding, Creating and Delivering Value,' with James Anderson, James Narus and Das Narayandas, Pearson Publishing, in June 2010; and 'Smartonomics



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