

CHAPTER I

UNDERSTANDING DISASTER:
AN OVERVIEW

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As the present work deals with the impact of flood on Tambwe Village and flood is considered a type of natural disaster, the present introductory chapter focuses on the concept of disaster in general and flood, its types and impact in particular.

The Indian subcontinent is very vulnerable to droughts, floods, earthquakes, forest fires, Landslides and cyclones. Among all the disasters that occur in the country, floods are the most frequently occurring natural disasters. This happens due to the irregularities of the monsoon. In India, rains are concentrated in three to four months of the monsoon season. As a result, there is very heavy discharge from the rivers during this period causing widespread floods. The 2006 monsoon proved to be extremely erratic for Maharashtra as a whole. As in the case of some other rivers in Maharashtra, many villages located on the bank of Koyana River were badly affected especially in the month of July 2006. This study focuses on the Impact of flood (2006) on Tambwe village. Let us now understand the meaning, features and effects of disaster and also about the disaster management plans at various levels.

A) MEANING OF THE TERM 'DISASTER':

The disaster is an unexpected happening causing a huge loss of life and property. Disaster may come in the form of earthquakes, cyclones, floods, drought, fire etc. and it spoils the life and property of the people. Disaster may be both natural as well as man-made or combination of these two. Though the events such as floods and earthquakes are natural these are increasingly becoming man-made; anthropogenic in their character.

As Singh (2003 : 6) notes, "the term 'disaster' owns its, origin to the French word 'deastre' which is combination of two words 'des' meaning bad and 'astre' meaning star. Thus, the term 'disaster' in this sense refers to bad or evil star. In earlier days disasters were considered to be an outcome or outburst of some unfavourable star. Now, more scientific understanding of the term disaster has been developed".

Let us study some of the definitions of the term 'disaster':

- 1) A disaster may defined as "serious disruption of the functioning of society, causing widespread human, material and environmental losses which exceeds the ability of affected society to cope using its own resources". (Singh R.B. 2003: - 6)
- 2) As Chougule Vaishali Chandrashekhar (2005 2) notes, Turner (1977) has given a rather comprehensive definition of disaster : "An event, concentrated in time and space, which threaten a society or a relatively self-sufficient, sub-division of a society, with major unwanted consequences as a result of the collapse of precautions which had hitherto been culturally accepted as adequate."
- 3) Kreps (1984) while ~~the earlier notion of disaster,~~ elaborating upon, gave a more detailed picture of disaster in the following definition:
~~the earlier notion of disaster,~~

"Disasters are events, observable in time and space, in which societies or their larger sub-units (e.g. communities, regions) incur physical damage and losses and/or disruption of their routine functioning. Both the causes and consequences of those events are related to the social structures and processes of society of their sub-units". Chougule Vaishali Chandrashekhar (2005 : 2)

Let us now understand some of the features of disaster.

B) FEATURES OF DISASTER:

Disasters have a number of common features. These features have been listed by Smith Keith (1996 : 15-16) :

1. "The origin of the damaging process or event is clear and produces characteristic threats to human life or well-being, e.g. a flood causes death by drowning.
2. The warning time is normally short : i.e. the hazards are often known as rapid onset events. This means that they can be unaccepted even though they occur within known hazard zone such as the flood plain of a small river basin.
3. Most of the direct losses, whether to life or property, are suffered fairly shortly after the event i.e. within days or weeks.
4. The exposure to hazard or assumed risk is largely involuntary, normally due to the location of people in a hazardous area e.g. the unplanned expansion of some third world cities onto unstable hill slopes.
5. The resulting disaster occurs with an intensity that justifies an emergency response, i.e. the provision of specialist aid to the victims. The scale of response can vary from local to international."

(Smith Keith 1996 : 15-16)

In short, disaster may be understood as those extreme events, either natural or man induced, which exceed the tolerable magnitude within or beyond certain time limits, make adjustment difficult, result in catastrophic losses of property and lives.

As Smith Keith (1996 : 28-29) notes, " Disaster engenders social, economic, health and environment problems. Many people suffer increased hardship after disaster including personal injury, loss of property, destruction of the family home, malnutrition, loss of

employment, debt and even forced migration". (Smith Keith : 1996: 28-29)

Further as Smith Keith(1996 : 32) notes, the effect of disaster on mental health are attracting increasing attention. "There is a consensus view that severe disaster produce longer term P'sychiatric disturbance. The symptoms can include shock, anxiety, stress and apathy and are expressed through sleep disturbance, belligerence and alcohol abuse. After some disasters, attitudes of blame, resentment and hostility have emerged and many pre-existing social problems are exacerbated by evacuation and relocation-when established neighborhood ties are broken. Such problems can exist and be prolonged". (Smith Keith : 1996 : 32)

C) TYPES OF DISASTER :

Generally, Disasters are of two types:

1. Natural Disaster
2. Anthropogenic Disaster

As Samant Jay S. (2005 : 155-156) notes:

1. Natural Disaster :

"Natural disasters occurs as a result of nature's extremities in the environment. Natural hazards and disasters that result can be divided into several different categories.

a) Geologic Disasters :

These include earthquakes, volcanic eruptions, tsunamis, landslides, flood, subsidence, impacts with outer space objects etc.

b) Atmospheric Disasters :

Hurricanes, tornadoes, droughts, severe thunder storms, lightening etc. are major atmospheric disasters.

c) Other natural disaster :

Insect infestations, diseases, wildfires are other natural disasters.

d) Catastrophic Rapid onset and slow onset disasters:

i) Catastrophic Disaster:

Natural hazards can also be divided into catastrophic disaster which have devastating consequences to huge number of people, or have a world-wide effect, such as impact with large space objects, huge volcanic eruptions, world-wide disease, epidemics, and world-wide droughts. Such catastrophic hazards only have a small chance of occurring, but can have devastating results if they do occur.

ii) Rapid onset disasters:

Natural disasters can also be divided into rapid onset disaster, and slow onset disaster. first types includes events such as volcanic Eruptions, Earthquakes, floods, Landslides, severe, Thunderstorms., Lightening and wild-fires, which develop with little warning and strike rapidly.

iii) Slow onset disaster:

Like drought, insect infestations and disease epidemics take years to develop.

2) Anthropogenic Disaster:

These are disasters which occur as result of human interaction with environment. They include technological disasters as well. These disasters often aggravate the impact of natural disaster. The technological disaster occurs due to exposure to hazardous substances such as radium, mercury, asbestos, fibbers and coal dust. They also include other disasters that have formed only through human interaction (such as acid rain) and contamination of the atmosphere or

surface water with harmful substances as well as the destruction of the ozone layer and global warming.”.

(Samant, Jay S. 2005: 155-156)

There is plenty of evidence that disasters claim most lives in the poorest countries, whether the impact is calculated absolutely or relatively according to the total population at risk. Within such countries repeated disaster strikes accumulate to prolonged economic and social problems. Disasters are mainly caused by population growth, land pressure, urbanization, inequality, climate change, political change, economic growth, technological innovation and exploitation of natural resources. (Ibid)

D) TYPES OF DISASTER EFFECTS :

There are four types of disaster effects .These types have been listed by smith keith (1996: 21) :

1) Direct effects :

"These effect occur immediately after an event has taken place (e.g. the deaths and damage caused by the throwing down of building in an earthquake).

2) Indirect effects :

These effects emerge later and may be much more difficult to attribute directly to the event. These include factors such as mental illness resulting from shock, bereavement and evacuation.

3) Tangible effects :

These effects are those to which it is possible to assign reasonably reliable monetary values such as the replacement of damaged property.

4) Intangible effects :

These effects can't be satisfactorily assessed in monetary terms. These distinctions are not entirely static. The loss of human life, for

example, has proved notoriously difficult to assess financially in the past but as methods improve it is becoming a more tangible effects"

(Smith keith :1996 : 21)

E) DISASTER MANAGEMENT:

Due to disaster, loss of life and property occurs. To reduce the detrimental effects of disasters, disaster management has become one of the most important areas of concern in contemporary times. The disaster risk management programmes are being evolved; let us briefly understand the progress made in this direction in India.

a) Meaning and forms of disaster management :

Disaster management is "a collective term encompassing all aspects of planning for and responding to disasters, including both pre and post disaster activities".(Source : Internet website – 1)

Generally disaster management measures are of two types:

1. Pre-Disaster Management
2. Post - Disaster Management

i) Pre-Disaster Management:

Disaster management which is planned before occurrence of disaster is called as pre-disaster management. Government of Maharashtra had prepared (1997) the State Disaster Management Action Plan (SDMAP) including preparedness for flood on the lines of Model Action Plan (MAP) formulated by Government of India in 1981, exclusively for management of floods. The SDMAP is in existence for its operation by various departments and agencies of GOM and other Non-Governmental Organisations (NGOs). It includes:

1. Formation of co-ordination committee both at the state level and district level for meeting periodically before monsoon, in association with NGOs concerned.

2. Formation of emergency operation control centers equipped with a number of telephones, wireless sets, with arrangement to man them round the clock.
3. Broadcasting educational and informative talks on disaster preparedness for general public.
4. System of keeping strict vigil on the water levels in the reservoirs through reservoirs engineers and communicating flood warning down the line before releasing water therefrom.
5. Imparting training to state level officials, private sector, and NGOs through Yashwantrao Chawhan Academy of development Administration (YASHADA), and.
6. Keeping warning and communication system and instruments in the Emergency operation centre (EOC) in operational condition.

Similar plans shall also to be prepared at district level, taluka level and village Annual action plan is also to be prepared at taluka level.

ii) Post - disaster management:

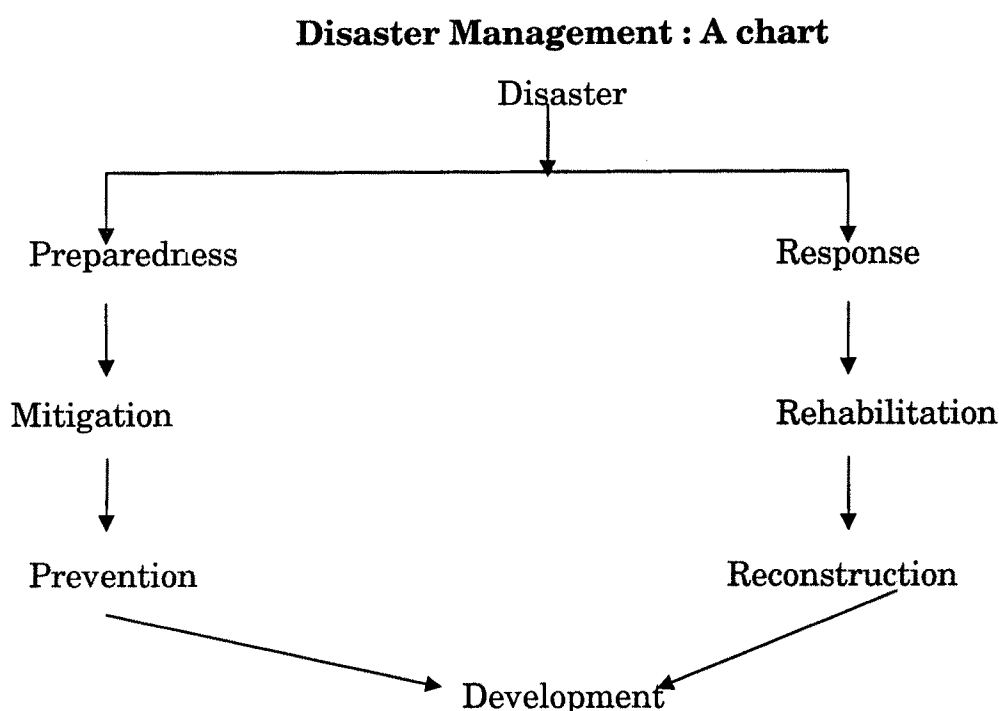
The disaster management which is planned after the occurrence of event is called as post-disaster management.

While extending relief and rehabilitation operation during and after disaster, evaluation shall be made for determining the adequacy of resources, shortcomings if any, co-ordination between various agencies, community participation, need for long term planning, etc. as prescribed in SDMAP which would eventually be helpful in updating the plans.

With a view to ensure proper implementation of the plans for meeting natural calamities, a check list of action points forwarded with MAP for arranging necessary actions by various departments and officials of the Revenue Department shall be used repeatedly and

periodically as follow-up measure; before, during and after the flood disaster".

(Sources : Internet websites -2.)



Disaster Risk Management Programme (2002-2007)

b) Disaster Risk Management : GOL, MHA, and UNDP :

"Government of India (GOI), Ministry of Home Affairs (MHA) and United Nations Development Programme (UNDP) have signed an agreement on August 2002 for implementation of "Disaster Risk Management" programme to reduce the vulnerability of the communities to natural disasters, in identified multi-hazard disaster prone area.

Goal :

"Sustainable Reduction in "Natural Disaster Risk" in some of the most hazard-prone districts in the selected states of India".

Programme phases :

The programme has been divided into two phases over a period of six years. Phase I (2002-2004) would provide support to carry out the activities of Bihar, Gujarat and Orissa.

In phase II (2003-2007) the programme would cover 141 districts in the states of Assam, Meghalaya, Sikkim, west Bengal, Uttaranchal, Uttar Pradesh, Delhi, Maharashtra, Tamilnadu, Manipur, Mizoram, Tripura, Arunachal Pradesh and Nagaland.

Objectives :

The four main objectives of this programme are :

1. National capacity building support to the Ministry of Home Affairs.
2. Environment building, education, awareness programmes and strengthening capacities at all levels in Natural disaster risk management and sustainable recovery.
3. Multi-hazard preparedness response and mitigation plans for the programme at state, district, block, village and ward level in select programme states and districts .
4. Networking knowledge on effective approaches, methods and tools for natural disaster risk management, developing and promoting policy-frame works".

(Sources : Internet website :3)

C) Maharashtra Disaster Management plan :

Menon describes dimension of Maharashtra disaster management plan. He notes following dimensions :

Types of plan :

Maharashtra disaster management plan are as follows :

1. Communication Network.
2. State Disaster Management Plan.

3. District Disaster Management Plan.

1) **Communication Network:**

"This network of telecommunication and information technology consists of an Emergency Operations centre (Central Control Room) at Mantralaya Management, Mumbai, a standby Control Room at the centre for Disaster Management, YASHADA, Pune, Control Rooms at each of the six divisional headquarters, and District Control Rooms at each district collectorate. This network is connected with vast telecommunication facilities for data, voice and information exchange and video teleconferencing.

In second level of communication network, all tahsils are linked together through a VHF Wireless Network with nodes of the District Control room reaching each tahsil headquarters.

This telecommunication network will facilitate video-teleconferencing among the nodes for more purposive and successful monitoring and management of such disaster. VHP Network is used to link the sub-divisional and taluka headquarters with the respective district headquarters. Some up-to-date amenities like wireless base stations, mobile sets and walkie-talkie units are provided to the sub-divisional officers to improvise the contact with District Control Room.

2) **State Disaster Management Plan :**

Maharashtra is the first state to prepare a comprehensive State Disaster Management Plan and also undertake risk assessment and vulnerability analysis of the state. These studies address the vulnerability of various districts, talukas within these district and clusters of villages in these districts to earthquakes, floods and cyclones, epidemics road accidents and fire and chemical and industrial disaster. A separate volume on standard operating procedure details

the manuals for various departments to be activated during an emergency.

In the District Control Room, the following desks are recommended to be set up for improving the capability of district administration to respond to disaster more effectively: operations desk, service desk, Infrastructure desk, Logistics desk, Agriculture desk, Communication and Information Management desk and Resources desk. Detailed instructions have been provided to the district administration about the setting up of the District Control Room and the VHF wireless network, linking all tahsil headquarters to District Control Room.

The involvement of the NGOs and community-based organizations like Tarun Mandals, Mahila Mandals, etc. is very vital for the smooth implementation of the of the District Disaster Management Plans. New institutional mechanisms for community participation have been envisaged in the plans like setting up of the Community Emergency Response Teams, Mutual Aid and Response Groups etc. Community participation is also sought in generating greater awareness about the nature of each disaster, the type of damage that can occur and the stress it would generate both at the family as well as the community level and also the mobilisation of communities to adopt risk reduction strategies and practices based on the coping strategies of stake holders in similar disaster - prone context.

3) District Disaster Management Plan :

The Government of Maharashtra has identified one district from each of the six revenue divisions for preparing the multi-hazard response plans with financial support from the ODA,UK. This was also supplemented with the preparation of multi-hazard response plans for

the remaining 25 districts, with financial support from UNDP, through the centre for Disaster Management, YASHADA. These multi-hazard response plans include an exhaustive risk assessment and vulnerability analysis of the district, with reference to earthquakes, floods, and cyclones, epidemics road accidents and fire and chemical and industrial disasters. They also contain the multi-hazard response structure, capacity analysis, including an inventory of resource and mitigation strategies, apart from a directory of personnel and institutions in the districts with their contact addresses, telephone and fax numbers.

DISASTER MANAGEMENT INFORMATION SYSTEM :

There are number of Disaster Management Information Systems. We can describe them as follows :

1. ARCINFO :

The maps of the districts with taluka-wise and village wise details were prepared using ARCINFO.

2. DMIS :

For developing a comprehensive Disaster Management Information System, DMIS was conceptualized as data-ware-house for effective management of disaster situation such as earthquake, floods, accidents, fire, cyclone, etc. at State, Divisional, District and Tahsil level.

3. MRSAC:

Maharashtra Remote Sensing Applications Centre, Nagpur.

4. GIS:

This Geographic Information System Operates as front-end with a disaster Management database, providing it flexibility to respond to

user queries regarding village specific details of availability of infrastructure.

This integrated facility of multi-hazard response plans, communication network, GIS, Disaster Geomorphology geophysical data and data on climate like rainfall pattern temperature, wind Management Information System, can enhance the level of preparedness of district administration and also improve the capability of district machinery to respond to disasters more effectively. The thematic data on natural resources are like slope, soils, geology and land use, land cover, drainage network, surface reservoirs hydro-humidity etc.

The non-spatial data consist of administrative set up, socio-economic and demographic profile of the population, water resources, irrigation, health facilities, educational infrastructure animal husbandry, agriculture, power, infrastructure, industry, fisheries, public distribution system, tourism etc.

All the villages in the state have been assessed for the availability of various facilities listed above and their infrastructure capabilities have been mapped and included a in the data base to permit querying.

MITIGATION MEASURES OF DISASTER:

Mitigation measures of disaster have two types:

- 1) Structural mitigation measures .
- 2) Non-structural mitigation measures.

1. Structural mitigation measures :

Structural mitigation measures like strengthening of government and public buildings have already been initiated. It is proposed to set up fire brigades in strategic municipal towns where such facilities

haven't been available for a very long time and where the risk assessment studies indicate and that several neighbouring area are prone to fires based on past episodes.

2. Non-Structural mitigation measures :

Non-structural mitigation measures like the modification in zoning for irrigation and building codes, earthquake resistant construction for non-engineered building etc. have also been initiated.

The construction of adequate speed breakers, caution, signboards and guard-stones on highways, the strategic locations, trauma-care facilities in district hospitals, bypass roads, identification of accident-prone spots, improvement and strengthening of roads and bridges etc. are also being carried out, to improve the preparedness of the district administration to respond to disaster more effectively.

A District Disaster Management Committee assists the Districts, in reviewing the threat of various disasters, assessing the vulnerability of the district, evaluating the preparedness and considering suggestions for improvement of the district disaster management plan".

(Sources : Internet website -4)

As the present work focuses on the impact of flood on the village life, let us now turn our attention, towards the understanding of the meaning of flood, its types, characteristics, effects and flood control.

A. MEANING OF FLOOD :

As Khemchand David (2000 : 104) notes, Flood means the overflowing of a river or the temporary rise in the level of the sea or a lake which results in the inundation of dry land. River and lake floods are caused by the inability of these water bodies to accommodate an increased supply of water. this increased supply may occur naturally because of for example, usually heavy rainfall or rapidly melting snow or may be the results of human activities. Land drainage schemes can

also disrupt the hydrological balance and generate flooding further down the drainage system".

(Khemchand David: 2000 :104)

Flood are common and costly natural disaster : Floods means inundation of normally dry land by water. Floods are common and costly natural disasters. "Floods usually are local, short lived events that can happen suddenly, sometimes with little or no warning. They usually are caused by intense storms that produce more run off that an area can store or a stream can carry within its normal channel. Rivers can also flood when dam fall, when ice jams or land slides temporarily block a channel or when snow melts rapidly. In a broader sense, normally dry lands can be flooded by high lake levels, by high tides, or by waves driven ashore by strong winds. Small streams are subject to flood (very rapid increases in runoff), which may last from a few minutes to a few hours. On larger streams, floods usually last from several hours to a few days.

Weather patterns can determine when floods occur :

Floods can occur at any time, but weather patterns have a strong influence on when and where floods happen. Cyclones, or storms that brings moisture inland from the ocean, can cause floods. Thunder storms are relatively small but intense storms that can cause floods in smaller streams. Frontal storms from at the front of large, moist air masses moving across the country and can cause floods Hurricanes are intense tropical storms that can cause floods".

(Sources: Internet website 5)

TYPES OF FLOODS:

Types of floods are as follows:

1. River flood:

"Flooding along rivers is a natural and inevitable part of life. Some floods occur seasonally when winter or spring rains coupled with melting snows, fill river basins with too much water too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

2. Coastal flood :

Winds generated from tropical storms and hurricanes or intense off shore low pressure systems can drive ocean water inland and cause significant flooding. Escape routes can be cut off and blocked by high water. Coastal flooding can also be produced by sea waves called tsunamis sometimes referred to as tidal waves. These waves are produced by earthquakes or Volcanic activities.

3. Urban flood :

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization increases run off 2 to 6 times over what would occur on natural terrain. During periods of urban flooding, streets can become swift moving rivers, while basements can become death traps as they fill with water.

4. Flash flood :

An arroyo is a water-carved gully or normally dry creek bed. Arroyos can fill with fast-moving water very quickly. Flash flooding at this arroyo in Arizona took only 58 seconds to develop.

5. Ice JAM :

Floating ice can accumulate at a natural or man-made obstruction and stop the flow of water”.

(Source : Internet website :6)

FLOOD CHARACTERISTICS :

Generally four characteristics of flood are following. These characteristic have been listed by Ghosh G.K. (2006: 130-131) : notes,

- 1) Flash flood
- 2) River flood
- 3) Coastal flood
- 4) Predictability

1. Flash flood :

"Accelerated run off, dam failure, breaking of ice jam.

2. River flood :

Slow building, usually seasonal in river system.

3. Coastal flood :

Coastal flood is associated with tropical cyclones, tsunami waves, storms surges, factors affecting degrees of danger, depth of water, duration, velocity rate of rise, frequency of occurrence, seasonality ,predictability etc

4) Predictability :

Flood forecasting depends on seasonal patterns, capacity of drainage basin, flood plain mapping, surveys by air and land. Warning is possible well in advance for seasonal flood but only minutes before in case of storm surge flash or tsunami".

(Ghosh G.K. 2006 pp -130-131)

EFFECTS OF FLOODS :

Floods effects are divided into two types as follows :

- 1) Domestic effects
- 2) National effects

1) Domestic effects :

"The number of people affected by the current wave of flood in the state reaches to an uncountable number. Erosion of people continues in several places of the effected place. City drainage systems fail to serve their purpose, Drains carry the polluted waste water which should have actually gone to a sewerage system for treatment."

2) National effects :

"Soil erosion is one of the main effects of heavy floods. The rivers flow above the danger level. The affected places remain cut off with the rest of the country. All the rivers rise rapidly. Insufficient stock of food and medicine to cope with the situation is the another effects, The flood water also damages several hutments, granaries, fisheries, standing crops. Several roads and relief camps may also be submerged by flood water, Landslides followed by incessant rains during floods is a very common phenomena. Flood producing rains can trigger catastrophic debris slides. Floods can roll boulders, tear out trees, destroy building and bridges and scour out new channels. Flood waters can reach heights of 10 to 20 feet and often carry a deadly cargo of debris".

(Sources : Internet website - 7)

FLOOD CONTROL :

The flood may be controlled by two ways, flood abatement and flood diversion.

A) Flood abatement :

Flood abatement means flood reduction which is done by two paths:

- 1) Weather modification
- 2) Watershed Treatment

1) Weather Modification :

As Smith Keith (1996 : 273-279) notes, "this response does not exist on an operational basis for flood abatement because of the uncertainties highlighted. The only way it could work would be by reducing the initial input of precipitation into one basin by encouraging it to fall elsewhere.

2) Watershed Treatment :

It includes reforestation and reseeding of separately vegetated areas to evaporate losses, mechanical land treatment of slopes i.e. contour ploughing, reducing run off coefficient, protection of vegetation by prohibiting over-grazing, preservation of natural water detention zones swam to lands and wetlands also helps in reducing flood possibilities.

B) Flood Diversion Measures :

Diversion of flood water may be changed by using various techniques.

- 1) Levees
- 2) Channel improvement
- 3) Reservoirs
- 4) Hazard Resistant Design

1) Levees :

It comes under river control engineering. Their design is to restrict flood water to waste land on the flood plains. It is relatively cheap method to control flood.

But there are also limitations to levees for example, sometimes flood water level increases than that of a designed height and over flooding occurs.

2) Channel Improvement :

It can be achieved by so many ways For example, channel enlargement, which increases the carrying capacity of the river by enlarging the cross-sectional area of the channel so that flood flows are contained within the banks. Flood relief channels are also helpful for providing extra overspill storage.

3) Reservoirs :

The principle of storing excess water in the upper drainage basin of reservoirs; so that, by careful regulation of that water can subsequently be released at a non damaging rate. Surface storage reservoirs are conventional technology but sometimes it can be subject to earthquakes rapid siltation.

4) Hazard Resistant design :

In this technology, the buildings and their contents are designed in a manner that it can reduce flood.

It consists of blocking up of certain entrances, the use of shields to seal doors and windows, use of sand bags to keep flood water away from structures. Removing damageable goods to higher levels or the greasing and covering of mechanical equipment.

Raising the living spaces above the likely flood level is also employed to reduce flood losses. Various flood loss reducing designs are employed now.

Building back from any water body and the water-proofing to basement area are precautionary steps that may be taken before flood

(Smith Keith: 1996 : 273-279).

By using above given techniques we can control the flood .Intensity of flood can be reduced up to some extent and socio-economic impact on villages will be decreased.

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