



## SIGNIFICANCE OF FLOOD MANAGEMENT FOR SUSTAINABLE DEVELOPMENT: A CASE STUDY OF KOLHAPUR

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### ABSTRACT

Floods are one of the most common and recurring natural disasters in the world. The economic loss and life damage caused by floods have put more strain on the economy than any other natural disaster due to their recurrence. Heavy rains have also resulted in the melting of snow, which has resulted in an increase in the water level in natural bodies. Flooding is defined as an excess of water that overflows a stream's artificial or natural boundary. Because of their proximity to rivers, soil, abundant water supply, and readily available transportation, flood plains are the places where human settlements prefer to settle. Primary data for this study was collected through a survey, and secondary data was gathered from books, journals, and other periodicals, as well as reports from the government and other agencies. It has been discovered that flood water management will most likely play a critical role in the economic development and upliftment of society.

**KEY WORD:** Flood, Disaster, Preparedness, management.

### INTRODUCTION

Flooding is a common and natural occurrence. "Flooding is a temporary condition characterized by partial or complete inundation of normally dry areas due to inland or tidal water overflow, or unusual and rapid accumulation or runoff. Flooding is defined as "a temporary covering of land by water that is not normally covered by water." River floods, heavy rain floods, and sea floods are all examples of this. A flood is a large amount of water that overflows the artificial or natural boundaries of a stream, river, or other water body onto normally dry land. Flooding can also be caused by the volume of water within a body of water, such as a river or lake, overflowing or breaking levees, allowing some of the water to escape its usual boundaries. During the monsoon, flooding is a common occurrence.

Flooding has devastating consequences for people, the economy, and the environment. Although demographic studies suggest ways to identify a more vulnerable population, a person's ability to prepare for and cope with a flooding event is highly individual. The population directly affected by the flood (in terms of direct property damage or loss of life) usually bears the brunt of the consequences. Indirectly affected by flood events, however, is a population that is also affected and suffers damages. River overflows, dam failures, flash flooding, tsunamis, hurricanes, and storm surges are all potential causes of flooding. Riverine floods are particularly severe in urban areas located on low-lying areas in the middle or lower reaches of rivers. Flood plains are subjected to annual flooding in most major river basins. Urban development frequently encroaches on some floodplains, reducing the area into which floods can naturally overflow. In highly



urbanized catchments, the land is the most important factor in assessing flooding. The floods caused by the overflow of the Pechanga River in Kolhapur, Maharashtra, India are the subject of this study.

## **2. OBJECTIVES OF THE STUDY:**

- 1) To study the Flood management of Kolhapur.
- 2) To study the significance of Flood management.

## **3. RESEARCH METHODOLOGY:**

Every research is necessary a specific methodology so for the present research has used specific methodology. For the collection of data, the researcher has used the primary and secondary source. The study is analytical and descriptive in nature. Primary data has collected by survey method and Secondary data required for the study are collected from books, journals and other Government websites, periodicals, and reports etc.

## **4. LIMITATION OF THE STUDY:**

The major limitation of this research is that the present research is related to only Flood management in Kolhapur only. Researcher is not covered all dimensions of Flood management. The conclusion of this research may not be applicable to other.

## **5. PROBLEM DEFINITION**

Flooding has devastating consequences for people, the economy, and the environment. Although demographic studies suggest ways to identify a more vulnerable population, a person's ability to prepare for and cope with a flooding event is highly individual. The population directly affected by the flood (in terms of direct property damage or loss of life) usually bears the brunt of the consequences. Indirectly affected by flood events, however, is a population that is also affected and suffers damages. River overflows, dam failures, flash flooding, tsunamis, hurricanes, and storm surges are all potential causes of flooding. Riverine floods are particularly damaging to urban areas located on low-lying areas in the middle or lower reaches of rivers. Flood plains are flooded on an annual basis in most major river basins. Urbanization frequently encroaches on some floodplains, reducing the area into which floodwaters can naturally overflow. In highly urbanized catchments, the land is the most important factor in predicting flooding. The floods caused by the Panchganga River overflowing in Kolhapur, Maharashtra, India are the subject of this research.

## **6. CAUSES OF FLOODS**

Flooding occurs when rivers' capacity to contain high flows brought down from the upper catchment areas following heavy rainfall is insufficient. Over the years, the tendency to occupy flood plains has been a major source of concern. Because of the varying rainfall distribution, areas that are not traditionally prone to flooding are frequently inundated. The accumulation of water from heavy rainfall floods areas with poor drainage facilities. Water-logging is exacerbated by excessive irrigation water applied to command areas and an increase in ground water levels due to seepage from canals and irrigated fields. Factors such as silting of riverbeds, reduced carrying capacity of river channels, erosion of beds and banks leading to changes in river courses, landslides obstructing flow, synchronization of floods in the main and tributary rivers, and retardation due to tidal effects exacerbate the problem.

## **7. FLOOD PREPAREDNESS**

Floods, which are a natural hazard, do not have to be a disaster if we are prepared and know what to do in the event of one. This would reduce the number of people killed and the amount of suffering they endured. This guide outlines simple steps that can be taken to stay safe and protect one from flooding.

### 7.1. BEFORE FLOODING OCCURS

- 1) The route to the nearest safe shelters is to be known.
- 2) The First Aid Kit is to be ready with extra medication for snake bite and diarrhea.
- 3) Strong ropes should be available for tying things.
- 4) A radio, torch and spare batteries are to be arranged.
- 5) Fresh water, dry food, candles, matchbox, kerosene etc are to be stocked.
- 6) Umbrellas and bamboo sticks are also necessary to protect from snakes).
- 7) Higher ground is to be selected for stay where people and animals can take shelter.

### 7.2. AFTER HEARING A FLOOD WARNING

- 1) Flood warning and advice may be easily obtained through radio and television.
- 2) We must keep vigil of flood warning given by local authorities.
- 3) Dry food and drinking water and warm clothes are made to be ready. o Emergency kit must be checked.

### 7.3. AT THE TIME OF EVACUATION

- 1) Pack clothing, essential medication, valuables, personal papers etc in water proof bags to be taken to the safe shelter.
- 2) Raise furniture, appliances on beds and tables.
- 3) Put sandbags in the toilet bowl and cover all drain holes to prevent sewage backflow.
- 4) Do not get into water of unknown depth and current.
- 5) Lock your house and take the recommended or known evacuation routes for your area of safe shelter. D. During Floods
- 6) Boiled water or use of halogen tablet to purify water must be used.
- 7) Food should be covered.
- 8) Children are not allowed to remain on empty stomach.
- 9) Bleaching powder and lime are to be used to disinfect the surroundings.
- 10) Entry in flood waters may be avoided. If one need to enter then proper foot wear may be used.
- 11) Water over knee level may be avoided.

### 7.4. AFTER A FLOOD

- 1) One has to be in touch with local radio.
- 2) Children may not be allowed to play in, or near, flood waters.
- 3) One has to be stay away from drains, culverts. o Electrical appliances should not be used.
- 4) Food of floodwaters must be avoided.
- 5) Tap water should be boiled before use.
- 6) Halogen tablets must me used before drinking water.
- 7) One has to be careful of snake bites, snakebites are common during floods.

## 8. FLOOD PREPAREDNESS PLANNING

Flood preparedness planning entails putting in place a set of appropriate arrangements ahead of time to ensure a successful flood response. Public awareness raising on flood preparedness, response, and mitigation measures; Stockpiling of emergency relief materials, such as food, livestock fodder, emergency medicines, and materials for temporary shelter, are some of the most commonly identified flood preparedness activities. Installation of a community-based early warning system to ensure that flood warnings are issued in a timely and effective manner; Transportation to safe areas/evacuation centers; Ensuring access to health and sanitation facilities; Management of safe areas for temporary removal of people and property from a threatened location; Drills and rehearsals are conducted. The ability to clearly define and agree on the roles and responsibilities of relevant stakeholders, such as government agencies, disaster management organizations, the Red Cross, volunteer groups, and community members, is critical to

flood preparedness planning. Forming disaster management committees and teams at various levels to agree on a set of standard operating procedures (SOPs) defining what actions to take before, during, and after floods is one way to achieve this. The advantages of flood preparedness planning are numerous, and a few of them are listed below:

- 1) Systematic arrangement and deployment of resources to reduce the impact of flood disaster.
- 2) Vulnerable communities to get access to crucial information, such as timely flood forecasts and warnings.
- 3) The provision of basic needs, such as shelter and medical care, clean water, sanitation and food during floods.
- 4) Continued access to livelihoods, in order to minimize disruption of economic activities; Effective coordination among disaster management agencies to ensure efficient emergency response during floods.
- 5) Urgent restoration of critical infrastructure and measures to be taken to bring normalcy immediately after the floods.

## 9. FLOOD MANAGEMENT

Though flood disasters cannot be completely avoided, the sufferings can be reduced by raising awareness of the likelihood of floods and their consequences, as well as developing a suitable warning system, flood preparedness, and flood disaster management through the use of information technology tools. A large number of scientific and technological resources and skills have become available as a result of changing trends, allowing disaster risk to be reduced. It is neither practical nor economically feasible to provide complete flood protection to all flood-prone areas for all magnitudes of floods with varying probabilities of occurrence. As a result, a practical approach to flood management is to use a combination of structural and non-structural measures to provide a reasonable level of protection against flood damage at a reasonable cost.

### STRUCTURAL MEASURES

The main thrust of flood protection programme undertaken in India so far has been in the nature of structural measures like:

- (i) Embankment, flood walls;
- (ii) Dams and reservoirs;
- (iii) Natural detention basin;
- (iv) Channel improvement;
- (v) Drainage improvement;
- (vi) Diversion of flood waters.

### 10. NON-STRUCTURAL MEASURES

Flood plain zoning is applicable to both unprotected and protected areas and aims to disseminate information to a wider audience in order to regulate indiscriminate and unplanned development in flood plains. Watershed development and management programs are currently being implemented under the Ministry of Agriculture, Ministry of Rural Areas and Employment, and Ministry of Forests' centrally sponsored schemes. Flood-proofing measures aid in the mitigation of distress and provide immediate relief to the affected population.

### 11. FLOOD RELIEF ARRANGEMENTS

If civil authorities' efforts to organize rescue operations and shelter are deemed insufficient, Army assistance should be requested. Non-governmental and voluntary organizations may be enlisted to help as much as possible. There should be relief camps set up. In the relief camps, basic amenities such as drinking water, sanitation, and public health care will be provided, as well as arrangements for cooked food. It is necessary to make the necessary arrangements for helicopters to drop food packets into the stranded

villages. It is necessary to organize sufficient relief parties to rescue the marooned people within a reasonable time frame. It will be necessary to establish alternative and effective communication links with marooned areas. Controlled kitchens for food storage must be set up for at least three days. If necessary, cattle camps will be set up, with veterinary care, fodder, and cattle feed provided to the affected animals. The provision of emergency relief to all those affected must be ensured. To avoid rumors, daily reports must be submitted and accurate information must be disseminated through the media. When the floods are over, some important steps must be taken:

- 1) Rehabilitation of homeless.
- 2) Commencement of agricultural activities.
- 3) Re-sowing.
- 4) Repair and reconstruction of infrastructural facilities such as roads and embankments.
- 5) Resettlement of flood prone areas.
- 6) Health measures.
- 7) Relief for economic reconstruction.

## 12. DATA ANALYSIS AND INTERPRITATION:

Table No-1

SR. NO.	PARTICULARS	NO. OF RESPONDENT	PERCENTAGE (%)	
1	Do you Know, Flood management	Yes	118	98.34
		No	02	1.66
		<b>Total</b>	<b>120</b>	<b>100</b>
2	Flood management is beneficial for Society?	Yes	117	97.5
		No	03	2.5
		<b>Total</b>	<b>120</b>	<b>100</b>
3	Affects of Flood on livelihood	Yes	116	96.66
		No	04	3.34
		<b>Total</b>	<b>120</b>	<b>100</b>
4	How will Flood management impact on people?	Positive	111	92.5
		Negative	09	7.5
		<b>Total</b>	<b>120</b>	<b>100</b>
5	Do you support disaster management	Support	118	98.34
		No support	02	1.66
		<b>Total</b>	<b>120</b>	<b>100</b>

The above table shows that 98.34% respondents know about the Flood management, 1.66% unknown about Flood management. So from the above table we can conclude that more of the respondents know about the Flood management. The table shows that 97.5% of the respondents says that Flood management is beneficial for Society, 2.5% says that Flood management is not beneficial for Society. The above table shows the Flood management affects livelihood. From the table it was observed that 96.66% of the respondents says that Flood management affects livelihood, 3.34% says that Flood management affects livelihood. From the above table it was found that a majority 96.66% respondent says that Flood management affects on livelihood. So from the above table we can conclude that water management is affects livelihood. The above table shows the Flood management impact on People. The above table shows that 92.5% respondents feel Positive for Flood management impact on People, 7.5% feel it was negative impact of Flood management on People. The above table shows whether support disaster management. The above table shows that 98.34% respondents support disaster management, 1.66% respondents are not support disaster management. So from the above tale we can conclude that Flood management beneficial for people.

Table No -2

SR. NO.		PARTICULARS	NO. OF RESPONDENT	PERCENTAGE (%)
1	Do you think sustainable water management particularly important?	YES	108	90
		No	12	10
		<b>Total</b>	<b>120</b>	<b>100</b>
2	Do you think bad water management is responsible for Flood condition?	YES	105	87.5
		No	15	12.5
		<b>Total</b>	<b>120</b>	<b>100</b>
3	Do you think fresh water be managed sustainably forever.	YES	119	99.16
		No	01	0.84
		<b>Total</b>	<b>120</b>	<b>100</b>
4	Society does to support to Flood management?	YES	99	82.5
		No	21	17.5
		<b>Total</b>	<b>120</b>	<b>100</b>
5	Is Flood/disaster Management Policy is necessary for quality and quantity	Yes	119	99.16
		No	01	0.84
		<b>Total</b>	<b>120</b>	<b>100</b>

The above table shows the sustainable water management particularly important. The table shows that 90% respondents says the sustainable water management particularly important, 10% says that sustainable water management is not particularly important. So from the above table it was found that water management particularly important. The above table shows the bad Flood management is responsible for Flood condition. The table indicates that 87.5% respondents says that bad Flood management is responsible for Flood condition, 12.5% says that bad water management is not responsible for Flood condition. So from the above table we can conclude that bad water management is responsible for Flood condition. The above table shows the fresh water be managed sustainably forever. The table shows that 99.16% respondents says that fresh water be managed sustainably forever, 0.84% respondents says that fresh water is not be managed sustainably forever. The above table shows the Society do to support to sustainable Flood management. The table shows that 82.5% respondents say that Society do to support to sustainable Flood management, 17.5% says that Society is not support to sustainable Flood management. So it can be conclude that Society do to support to sustainable water management. The above table shows that Water Management Policy is necessary for quality and quantity. 99.16% respondents support Water Management Policy is necessary for quality and quantity, 0.84% respondent's doses not support Water Management Policy is necessary for quality and quantity.

**Table No-3**

SR. NO.		PARTICULARS	NO. OF RESPONDENT	PERCENTAGE (%)
1	<b>Do you think water sector be managed by private or public entities</b>	private entities	29	24.16
		public entities	91	75.84
		<b>Total</b>	<b>120</b>	<b>100</b>
2	<b>Do you think bad water management is responsible for Flood condition</b>	Yes	98	81.66
		No	22	18.34
		<b>Total</b>	<b>120</b>	<b>100</b>
3	<b>Do you think action for saving water is water managements</b>	Yes	110	91.66
		No	10	8.34
		<b>Total</b>	<b>120</b>	<b>100</b>
4	<b>Satisfied with the government water management plan?</b>	Satisfied	23	80.84
		Unsatisfied	97	19.16
		<b>Total</b>	<b>120</b>	<b>100</b>
5	<b>What do you prefer the traditional water management system or new?</b>	Traditional	05	19.16
		New	115	95.84
		<b>Total</b>	<b>120</b>	<b>100</b>

The above table shows is water sector be managed by private or public entities. The above table shows that 24.16% respondents says that water sector be managed by private, 75.84% says water sector be managed by public entities. The above table shows that 81.66% respondents say that bad water management is responsible for drought condition, 18.34% respondents say that bad water management is not responsible for drought condition. The above table shows that 91.66% respondents say that action for saving water is water managements, 8.34% says action for saving water is not water managements. The above table shows the Satisfied with the government water management plan. The table shows that 80.84% respondents Satisfied with the government water management plan, 19.16% are not satisfied with the government water management plan. The above table shows that 19.16% respondents prefer traditional water management system, 95.84% prefer new water management system.

### 13. CONCLUSION:

Floods in India have become one of the worst natural disasters in recent years, killing thousands of people. The frequency and intensity have increased over time, causing significant damage to life and the economy. The Indian government has taken a number of steps to reduce the damage caused by floods and other natural disasters, but there is still a long way to go. Science and technology, as well as telecommunications and the media, can be used to alert people and prepare for disasters. Setting up an alarm system along the banks of rivers to warn nearby residents of rising water levels can also be an effective way to limit the damage. Aside from that, flood-affected areas can benefit from awareness campaigns and preparedness campaigns. Before the flood, the neighboring community can be relocated to a safer and higher location, reducing the risk of death. Quick delivery of goods and services such as medicine, food, and water aids in quick recovery and minimizes loss following a disaster. The flood trend and the damage it causes suggest that effective pre- and post-disaster mechanisms are required, as nature cannot be controlled but disasters can be reduced.



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