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## FLOOD: ITS SOCIO-ECONOMIC IMPACT AND MECHANISMS TO COMBAT

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### ABSTRACT:

In this article an attempt has been made to understand flood and its impact. Flood a natural disaster and its impact and mitigation techniques are the need of the hour. In this background; India is one of the most disastrous countries in the world. Calamities brings lot of sufferings damages, and economic loss to the society and country as well. Flood disasters are beyond human control and are often called as 'Rage of God'. In the history of mankind; India has faced some very deadly disasters and developing countries suffer the great loss when disaster hits. Natural disaster is an any odd event of nature, which affects sudden disruption to the normal

life of the society and causes damage to property, region, or ecology. It is also true that; to rehabilitate and compensate the damages, lot of time and money must spend.

Flood is one of the most frequent and devastating calamities in India. Flood means; a large amount of water that spread from a river, sea, or reservoir. During the southwest monsoon almost, all rivers carry huge amount of water, there by posing threat to floods. Among the natural disasters, flood accounted 33 percent. Over 60 percent flood damage in the country occurs from river floods and rest of the 40% by other sources.

Flood is a disastrous act of nature, its impact on man and ecology is enormous and in a multiple way. Therefore, to mitigate such natural calamities proper planning, designing, and implementing the developmental projects in a proper and scientific ways; is the need of the hour. This type of disasters may be prevented through the application of preparedness and mitigation techniques.

**KEY WORDS:** Concept of flood, socio-economic implications, and mechanisms to mitigate.

### INTRODUCTION:

Flood is a natural disaster & is unpredictable and are the part of every nation, hence no country in the world is entirely safe. Floods have no boundaries, it can strike at any movement, anywhere paving destruction in the present as well as in the future. The human losses in disasters in developing countries like India tend to high compared to developed nations. The calamities may be natural or manmade brings a lot of sufferings and pain to the people's life of the affected region and it take years to rehabilitate and compensate the damages. According to 2018 Global Climate Risk Index Report (GLRIR), India is the 14th most vulnerable country in the world. Flood poses a potential threat to life, property, shelter, environment and availability of food and water and is beyond human control and are often called as 'Rage of God.' In human history and at present day situation; India has faced some very deadly and noxious floods.

These calamities are the result of man's dreadful exploitation of natural resources like water, land, minerals, mountains, forest etc., for his selfishness. Orissa is the disaster capital of India. The other most sensitive Indian states face Natural calamities are – Assam, Andhra Pradesh, Maharashtra, Karnataka, Bihar, Uttarakhand, Himachal Kerala etc. are highly vulnerable to extreme disasters like floods, droughts, and cyclones.

India witnesses floods due to overflow of dams and cause for heavy loss to life, damage to property /economy, livelihood systems, infrastructure etc. India is highly vulnerable to floods and is the most frequent type of natural calamity. Out of the total geographical area of 329 million hectares, more than 40 million hectares is flooding prone region. Thus, floods are one of the most devastating natural disaster.

India has got two very distinct monsoons viz; southwest monsoon and Northeast monsoon. The south west monsoon starts from June to September and the Northeast monsoon covers the period from October to December. India gets 75 percent of its annual total rainfall and the remaining rest of the seasons. As a result of heavy Southwest monsoon, almost all the rivers carry huge amount of water thereby posing threat to floods. The frequency of major floods is more than once in 5 years. Thus, floods are the most frequent calamities in India accounting for 52% of total occurrence of disasters followed by cyclone 30%, landslides 10%, earthquake 5% and droughts 2 percent.

The common factor for large scale floods in India is heavy rainfall followed by others factors like inadequate dams' capacity, blockage in the river because of landslides, earthquakes, and blasting. Of the annual rainfall 75 percent concentrated over 4 months i.e., June to September and as a result all the rivers carry heavy discharge of water. The average area affected by floods annually is about 25 percent (8 million hectors). Every year 1.75 million people and 30,000 cattle are adversely affected by floods. The annual average cropped area affected is approximately 3.7 million hectors. The annual total damage to houses and public utilities is about 972.00 crores.

Between 1980 to 2017; India experienced 235 incidents of floods. The National Commission on Floods assessed (1980) that; the total flood prone area of India is around 40 million hectares which is equalling to 12% of the total area of India. The most flood prone and flood affected regions of the country are; Uttar Pradesh, Assam, Bihar, West Bengal, Odisha, Uttarakhand, Himachal Pradesh, and Andra Pradesh together accounts 62 percent of the total loss and damages by floods.

#### **METHODOLOGY AND DATA COLLECTION:**

Secondary data has been used to extract the information with related to natural disaster. The secondary sources like books, Journals, News Papers, Magazines, Research articles, Periodicals, Government of India data sources, T. V News, Ph.D. Thesis, websites, e-journalsetc., are used in this article for assessing the flood implications and mechanisms to combat.

#### **Objectives: The following are the important objectives of the research paper are-**

- ❖ To understand the flood a natural calamity
- ❖ To explore the impact of floods on economy
- ❖ To investigate flood impact on man and ecology
- ❖ To suggest flood mitigation mechanisms

#### **The Concept & Definition Flood:**

Landsman defines – “disaster is an any incident typically occurring suddenly that causes damage, ecological disruption, loss of human life, deterioration of health and health services often combined with damage to property and livelihood and which exceeds the capacity of the affected community on a scale sufficient to require outside assistance”.

Flood means a large amount of water that spread from a river, the sea or reservoir etc., that covers an area which should be dry. In other words, flood is a natural disaster that is caused due to the accumulation of excessive water in a region. Centre for Research on Epidemiology of Disasters (CRED) defines “flood Means, it is a significant rise of water level in a stream, lake, reservoir or coastal region.”

### SOCIO-ECONOMIC IMPLICATIONSOF FLOOD:

Floods are common and natural phenomena.It is one of the most disastrous acts of nature and impact on human life and ecology in multiple ways.Flood is one of the deadliest natural disasters that can cause havoc in the society and nature. Flood occurs during the period of heavy rainfall and it is immensely painful and leaves unequal effects on different spheres of an individual's life.

There are many adverse effects of floods on human settlements and economic activities.Floods can have a considerable impact on population, properties, business, public utility, destroy belongings, prevent to access of essential services, damage and loss to infrastructure, animals, aquatic animals, wild animals, flora and fauna, water pollution climate change, soil erosion etc. Thus, the effects of flood disaster are caused for many adverse impacts on man and societydirectly and indirectly.

- ❖ **Loss to human life:**Flood is the major cause of natural disaster and human can be affected in number of ways from flooding. Flash flooding is the most dangerous for human life, lose friends and family members.People can often get caught unwarily in flash floods and difficult to get escape from the hazardous situation.Asia is the most flood affected region, accounting about 50 percent of flood related fatalities in the 20 th century. India accounts 1/5 of global flood deaths and an average of 1650 for every year and gets injured.From 1980 to 2017 flood caused death about 1,26,286 and affected 1.93 billion Indian population.
- ❖ **Economic loss and property damage:** Empirical studies shown that; flood damage has negative impact on economic growth in the long run period and considerably reduces female employment opportunities in agricultural sector. Owing to disasters whole community can be uprooted, destroy homes and lively hoods. Declined in business, income, productive capital, loss of agricultural crops, public utilities, and Gross Domestic Product. Government data reveals that; between 1953 and 2011 crop and property damage (including house property) is of Rs. 3612 crores every year. In case of severe floods, the affected regions take years to re-build.
- ❖ **Loss of crops:** There are many factors which affects the crop production such as; wind, microbes, temperature pest attacks, heavy/ shortage of rainfall, (hydro -meteorological calamities) unseasonal rains etc. Among these, heavy rains, and flooding caused to submerge crop land into water and it paves loss to crops and quantum of yield. As per ministry of agriculture, between 2015-2016 aheavy rains and floods have damaged 33.9 million hectares of India's cropped area. The excess loss of crops of the farmers some times leads to suicidal cases too.
- ❖ **Heath problems like waterborne diseases& epidemics:** Floods result in the breeding of mosquitoes and other insects that are the cause of various diseases like dengue, dysentery, pneumonic plague, water, and vector -borne diseases like cholera, typhoid malaria etc. There is the problem of sanitation and contaminated drinking water cause the health problems. Apart from these, there is physical and mental health impacts due to loss of property and loss family or family members.
- ❖ **Loss of livestock and affect aquatic animals:** Disasters not only posed threat to mankind but have also taken livestock into consideration. The livestock sector plays a pivotal rolein nature resource-based livelihood of most of the Indian population and is subsidiary occupation to agriculture. It is often called as the poor people's source of employment, revenue, wealth, and ATM.Flooding causes the animalsto drown.Due to floodthe aquatic animals get displaced from their own nets.
- ❖ **Price hike of the commodities:** There is a shortage of supply and high demand, this results in increased prices of the goods and commodities. Moreover, the supply of materials and goods in the flood affected region lowers the transport facilities due to damage of roads and connectivity services. Many a time the stored commodities are also get spoiled owing to floods, this caused for price hikes.
- ❖ **Soil erosion during flood conditions:**Floods can have negative impact on the environment by eroding the soil. Soil erosion is a process that occurs when the impact of water or wind detaches and removes particles and caused for soil deterioration. Due to heavy rains and water flow the soil cannot absorb entire water and resulted into soil erosion and which in turn horrible consequences. In addition to this the quality of soil is also degraded.

- ❖ **Floods damages to the flora and fauna:** Floods not only threat to human beings and animals or property but it also destroys the flora and fauna. Flood damages for plants and creatures which surrounded in the environment. At the time of heavy rains, it accompanied lightning and thunder and stormsall these; cause for uprooting the trees. In this situation crops and other several plants and herbs are eroded and destroyed.
- ❖ **Displacement and evacuation problem:**Displacement caused mainly due to climatic conditions and natural calamities or sometimes owing to developmental projects.Displacement is a social phenomenon which requires preventive strategies within the frame work of social and economic development. In flooding situations people are forced to leave their habitual places and homes in order to avoid the adverse impact of an immediate and foreseeable natural calamities. Such forcibly displaced population is vulnerable to food insecurity and other civic amenities.
- ❖ **Loss of homes and other utilities:**Floods cause permanent structural damage to shelters/homes. The constructional design of house floor or roof can collapse due to its excessive water pressure. Thus, after floods it is very harder for affected population to survive. Apart from these,floods also result in damage to electrical and other utilities.
- ❖ **Stress reaction situations during and after floods:** Natural calamities like floods expose people to several health-related problems from morbidity to mortality.Sometimes, floods can lead to a range of negative mental health impacts. A review of some studies reveals that risk of experiencing post-traumatic stress disorder (PTSD), depression, psychological distress, pain,anxiety, and social dysfunctionsare more in flood affected regions compared with unaffected areas.
- ❖ **Loss of livelihood services and assets:**Floods directly affects crop production and farmers livelihood. It also threatens farmers sources of income and living conditions and push into poverty situation conditions. This natural disasters aften destroythe agricultural assets and infrastructure, disrupting production cycles, trade flow and livelihood means.Apart from all these, people unable to find work, disruption of production strategies, loss of land to erosion waterlogging, fisheries getting washed away, loss of livestock, agricultural tools, and equipment's etc.
- ❖ **Damage to flora and fauna:** Extreme floods seriously affect the biodiversity.Several natural disasters and human activities cause for depletion of flora and fauna.Sedimentation can destroy habitats and aquatic animals by decreasing the level of oxygen available.Microorganisms gives nitrogen to the plants and in return the plants give the organisms their shelter.Floods can also threaten, the survival of endangered species.
- ❖ **Loss of bridges, road ways and canals:** Floods effect on transportation network through physical damage to infrastructure. Along with loss of life; the floods also damage the buildings, bridges, roads, and canals.Bridges are key assets of the transport infrastructure upon which economy and societies are dependent.During the flash flooding many bridges got damaged and caused for problems like disruption for road network and property damage. Natural disaster cause for damage and loss of roads and thispaves for socio-economic problems

**TABLE -1**  
**DAMAGE DUE TO FLOOD IN INDIA FROM 1953-2016**

Year	Area affected in m.ha	Population affected in million	Damage to Crops		Damage to House		Cattle lost No's	Human lives lost in No's damage to public utilities	Damage to public utilities Rs. Crore	Total Damage in Rs. Crore (5+7+10)
			Area in m.ha	Values in Rs. Crores	No's	Val. In Rs. Crore				
1	2	3	4	5	6	7	8	9	10	11
1953-55	19.22	62.47	8.85	160.4	2131697	34.93	141596	1181	17.03	212.36
1956-60	33.66	55.18	6.77	196.15	2684881	40.65	128579	2332	33.53	270.33
1961-65	22.53	53.04	10.17	200.13	1836319	20.03	703.63	2923	16.45	236.61
1966-70	33.67	121.08	15.87	802.75	4170658	160.95	434729	6516	183.52	1147.24
1971-75	42.01	211.32	19.6	1632.85	5745543	251.71	366304	3960	515.77	2400.33
1976-80	56.32	243.98	30.56	2763.07	10776522	793.48	1552983	21635	1443.45	5000
1981-85	43.1	263.67	21.4	4731.27	9917125	1640.99	666415	8792	3125.56	11297.82
1986-90	51.35	237.8	25.86	6549.47	9047460	2104.05	549414 table	10860	6064.96	15062.88
1991-95	30.67	147.03	14.86	5518.63	6664510	2488.13	445705	9476	5605.49	13612.24
1996-00	36.61	194.83	18.91	10508.9	7406916	3417.88	422601	9445	12404.91	27174.95
2001-05	37.26	162.64	25.61	12058.42	4634195	3432.46	323178	7879	16273.01	32200.03
2006-10	18.14	114.5	22.39	19493.75	7873928	18577.59	561151	10791	56666.05	75642.34
2011-16	35.9	142.85	30.19	37657.86	6575325	11427.5	359658	9637	95580.44	144665.79

Source: Data compiled from Flood Forecast monitoring directorate, Central water commission, Government of India (2018)

**TABLE-2**  
**MAJOR FLOODS IN INDIA**

Sr.No.	State	Year	Loss and Damages
1	Maharashtra	2005	419 people and 16000 cattle were killed, over 1 lakh commercial establishments and 30000 vehicles damaged.
2	Surat	2006	120 and above deaths, property damage ranging from 9500 to 21000 crores.
3	Bihar	2007	Affected 10 million people, 4822 villages and 1 crore farm land were affected, 44,000 houses damaged, 29,000 houses destroyed, thousands of people were displaced in relief camps.
4	Bihar	2008	Affected to 3 million people and 250 deaths,3,40,000 ha. crops damaged, more than 3,00,000 houses destroyed loss of public facilities, and raw rice and flour mixed with polluted water, hunger and spread of deceases.
5	Andra Pradesh	2009	Over 13 lakh people affected, 37 deaths, 6295 livestock perished, 6189 cattle loss, 478 villages severely hit, 42000 houses damaged.
6	Tamil Nadu & Pondicherry	2010	203 lives lost, 8000 shelters fully damaged, 40,000 huts partially damaged, around 5068 livestock lost and 15 lakh acres of crops submerged.
7	Kerala, W.B & Bihar	2011	Affected 2,5,00,00 population and killed more than 130 people.
8	Assam	2012	124 lost their life, land slides 16 people killed & affected 2.2 million people.

9	Uttarakhand	2013	4000 deaths and affected 1 million people, evacuated more than 10000 people washed away bridges and roads.
10	Kashmir	2014	Affected 1000 villages, death of 300 people, 2 million families affected, 1.4 million people lost their household assets and livelihood, 67000 houses fully damaged, 66,000 partially damaged and few cities were submerged.
11	Chennai(T.N.)	2015	Death toll of 470, 12000 cattle were lost, 18 lakh people displaced and about 4.92 lakh houses were damaged in addition to heavy loss of property about Rs. 200 billion to 1 trillion.
12	Assam	2016	More than 1.6 million people affected, Damaged crop area of 2,770 hectares, 49,535 animals affected, property damage and many people displaced the, affected to Pobitora Wildlife & Kaziranga National Park around 300 wild animals reported drowned, largescale damage to homes, threats to livelihood etc.
13	Gujarat	2017	More 224 people died, heavy loss to livestock, crops, durable assets, damage to public & private infrastructure.
14	West Bengal	2017	20 lakh people affected over 60 villages, 50 people died, 2301 people evacuated from their houses, 1,79,321 hectares paddy seedbeds damaged, 2,02,957 hectare of land was submerged, about 7868 houses entirely destroyed and 44361 partially damaged, around Rs. 553 crores lost.
15	Bihar	2017	Around 1.71 crore people hit by the flood, affected 19 districts, death of 514 people.
16	Kerala	2018	445 deaths, 36,000 people displaced & affected 14 districts.

**FLOOD CONTROL MECHANISMS:**

Since time immemorial man has been trying to control floods. In ancient times methods of flood control have been practiced and the country has integrated administrative machinery for disaster management. The mitigation techniques and machineries are at National, State and District levels for undertaking the responsibility of relief and rescue measures in disaster events. Disaster management provides opportunities for planning, designing, and implementing the developmental projects. This process contributes to the mitigating the risks of disasters.

The flood forecasting and warning systems, cyclone detector and tracking system etc., plays the significant role to mitigate natural calamities. Science and technology inputs constitute its basic thrust, which is manifested in development of forecasting and warning systems and disaster resistant construction technologies. Flooding is caused by the inadequate capacity within the banks of rivers to contain the high flows brought down from the upper catchments owing to heavy rains.

Natural Hazards may be prevented through application of careful planning, preparedness, and mitigation measures. A well thought action plan for disaster management is the need of the hour and there should be sincere efforts to manage the problems. Already, Government of India has undertaken many steps to manage flood situations such as; National Flood Management Disaster Team, Flood management by establishing the dams, National Flood Management programme (1954), National flood Commission (1976), National Commission for Water Resources (1999), National Water Policy(2012), National Hydrology Project (2016), Flood Management and Border areas Programme FMBAP- etc.



**Floods; canbe prevented with the help of following techniques:**

- Restriction on cutting of trees
- Planned and proper constructionof dams and reservoirs
- Creation of suitable drainage system and channel improvements
- Deepening of the rivers
- Massive afforestation or planting the trees
- Diversion of flood water
- Installation of flood detection systems of machinery
- Need to drainage improvements
- Smart city projects to be undertaken
- Desililting of the river beds regularly
- Early warning or introduce better flood warning device
- To knowthe flood zone and understanding risk of flooding
- Live in the area which isnot prone to flooding
- Restore rivers and clean draining to prevent floods
- Upgrade bridges and roads
- Improved stormwater drainage systems
- Need to take proper and scientific meteorological forecasting
- Flood-proof shelters and structures are to be developed
- Take proper and in time measures to control floods
- Existing policies should be restructuring
- Creating awareness regarding disaster reduction
- Ensuring the disaster resistant construction of buildings and houses

**CONCLUSION:**

Floods are regular and common features in many parts of the country. It causes loss of lives property, threat and bringing untold misery to the people and society. These disasters are mainly due to natural reasons but now a days we can see an increase in floods is due to human interference. It is not possible to control floods wholly, but can prepared when it happens and what suitable measures to take to control it. Hence, depending on nature of floods, flood mitigation measures may lessen the adverse impact of flooding disaster.

Flood is the disruption to normal pattern of life, livelihood, property, injury, and health effects, effects on damage to infrastructure, buildings, communication facilities and other services. Disaster also effects on community needs like food, clothing, shelter, and medical facilities too. Though, natural disasters may happen due to natural imbalances but it is very distressing to see that; humans die; due to human induced activities. The fact of the matter is; every one of us is also responsible for destroying our environment and giving rise to such various problems.

Unless major steps from the Government and community participation the level of disasters is not mitigated. Flood calamities were mainly due to natural reasons but in recent days we can see an increase in floods due to human interference. Despite the various steps undertaken, the trend of increasing damage and loss brought by floods has posed a challenge to the Government and people. Creation of people centred early warning systems that enhances residents' awareness and preparedness to flood hazards is significantly reduce the adverse implications. Effective disaster management strategies will not only prevent loss of lives but also helps affected people in rebuilding their lives.

## REFERENCES:

1. <https://www.vedantu.com/chemistry/floodand-drought>
2. <https://www.jagranjosh.com/generalknowledge/amp/list-of-major-natural-disasters-in-the-history-ofindia-1590147440-1>
3. <https://byjus.com/free-ias-prep/flooding-in-india/>
4. <https://www.humanitariancoalition.ca>
5. Mumbai Rainfall -2005 researchgate.net
6. "Floods"who.int
7. "Flood management" - indiawris.gov.in
8. <https://www.thehindubusinessline.com/opinion/india-is-not-prepared-for-natural-disasters/article30463153.ece>
9. Oneindia.com-delhi
10. <https://www.blackdoainstitute.org.au>
11. Essay on Floods- infinitylearn.com
12. The Human Impact of Floods: a Historical Review of Events-1980- 2009. Ncbi.nlm.nih.gov
13. Enarson et al. (1998): "Through Women's Eyes -A Gendered Research Agenda for Social Science". Journal of Disaster Studies, Policy, and Management.
14. Rakesh Kanwar (2001) : "Disaster Management".XLIV The Administrator.
15. GOI (2004): "Disaster Management in India". A Status Report. National Disaster Management Devison, Ministry of Home affairs Government of India.
16. Jaya V. S. (2005): "Disasters -A Challenge to Human Security". In Vishnu Konoorayar& Jaya V.S. (eds) Disaster Management and Law. Indian Law Institute, New delhi.
17. Hoke, Z. (2005): "In Natural Disasters the Poor are Hardest Hit", Voice of America News.
18. Wagh,W.L.Jr.(2007): "Public Administration, Emergency Management and Disaster Policy". In McEntire,D.A. (ed) Disciplines, Disasters and Emergency Management.
19. Bihar Floods- 2008-<https://en.m.wikipedia.org>
20. Rajeevan M. et al (2008): "Analysis of Variability and Trends of Extreme Rainfall Events Over India, Using 104 Years of Gridded Daily Rainfall Data". Geographical Research Letters-35
21. Yasuhide Okuyama (2009):" Economic Impact of Disasters"- A global Analyses Sixth International Conference on Urban Earthquake Engineering.
22. Meera S. (2010) : "Legal Regulation of Disaster Management in India". A critical Analyses. The Academy Law Review.
23. Nazimuddin S.K. And Mashihur Rahaman (2014): "Floods in India: A Geographical Perspective".International Journal of Scientific Engineering and Research (IJSER).
24. GOI (2011): "Disaster Management in India"Ministry of Home Affairs, Govt of India-2011.
25. Jogia J. et al (2014): "Culture and the Psychological Impacts of Natural Disasters: Implications for Disaster Management and Disaster Mental Health". The Built & Human Environment Review Vol.7
26. SuyashSrivastv (2015):"India's Worst Man-MadeDisasters" <http://blog.ipleaders.in/indias-worst-man-made-avoidable-disasters>.
27. Oxfam Canada (2016): "Floods in Assam, Province India". Humanitarian Coalition.
28. Sebastien Foudi et al. (2017):"The Effects of Flooding on Mental Health: Lessons Learned for Building Resilience". Agu Publications.
29. P.G. Dhar Chakrabarti (2017): "Managing Risks of Disasters for Sustainable Development". Yojana-2017.
30. Santosh Kumar (2017): "Managing Disaster Risk". Yojana Vol.61.
31. GOI (2018): "Flood Forecast Monitoring Directorate, Central Water Commission, Government of India, Retrieved from <http://www.indiaenvironmentportal.org.in/file/>
32. Dave, R.K. (2018): "Disaster Management in India". Challenges and Strategies.
33. Top 10 Natural Disasters inthe History of India-<https://www.mapsofindia.com/my-india/travel/top-10-natural-disasters-in-the-history-of-india>.



34. "Regional Geography of Hazards and disaster management." Special Centre for Disaster Research- Jawaharlal Nehru University New Delhi, India.
35. (GOI):"National Disaster Management Authority" Government of India. <https://ndma.gov.in>
36. "Floods in India-Causes, Economic loss, Measures".<https://byjus.com/free-ias-prep/flooding-in india/>
37. "Worst Ever Floods in India Over Last Decade".<http://www.walkthroughindia.com/walkthrough/15-worst-ever -floods -in-india-over-last-decade/>
38. "Raidly Assessing Flood Damage in Uttarakhand, India".<https://www.worldbank.org>.
39. <https://en.m.wikipedia.org>
40. <https://gidm.gujarat.gov.in>
41. "West Bengal Floods" Wikipedia-2017.