ASSESSMENT OF FLOOD WITH ITS SOCIAL CONSEQUENCES AND ENVIRONMENTAL LAW

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ABSTRACT

An overflow of water from a lake or other body of water due to excessive rainfall or other input of water which takes away lives of hundreds and thousands of people as it has shown this year in its most devastating forms in Bihar as well as destroying property of lakhs and crores. The most affected are poor like farmers and our own economy. Flooding accounts for an estimated 40% of all natural disasters. Flash flooding is the leading cause of weather-related mortality in the world, caused through sudden, unexpected and significant rainfall or storm system advancements. The social impact of floods primarily encompasses damage to homes and displacement of the occupants that may, in turn, facilitate the diffusion of a virulent strain of bacteria because of cramped and crowded living conditions and less than adequate personal hygiene. Additionally, stress-related mental health or substance-abuse problems may be associated with flood disasters. Ravaging floods in Bihar have destroyed crops worth over Rs 150 crore so far and the figure could further rise in the coming days. Crops in 1.25 lakh hectares of area have been lost in the floods, and the total loss is estimated to be over Rs150 crore. Paddy and maize crops have been washed out completely, pulses, vegetables and plantation crops such as banana have also been damaged.

The World Conference on Natural Disaster Reduction, Yokohama (Japan) 1994 adopted a strategy for a safer world which includes guidelines for Natural Disaster Prevention, preparedness and mitigation. The conference affirmed that the impact of Natural Disasters in terms of human and economic losses has risen and society has become more vulnerable to such disasters over the past two decades, flood tidal waves, droughts, landslides and other natural events had killed some 3 million people and inflicted injury, displacement and misery on countless more. The number of people affected had increased by 6 percent per year, three times the global population growth rate. The 1994 Desertification Convention talked about a “Global Mechanism” which urged governments to act through the Global Environmental Facility to protect international waterways and prevent climate change. The Earth Summit 1992 better known as “Parliament of the Planet” took it as a last chance to save our dear planet Earth because we have one common future so the decided obligations will be binding on signatory States.

Out of the total India’s geographical area of 329 million hectare, about 40 million hectare is prone to floods. The protection against floods can be done by way of construction of embankments, drainage channels, town protection works and raising on platforms. What is also required is putting the water resources on the concurrent list to ensure a holistic approach and not a politically biased one also one need to opt for personal disaster Management methods.

Key Words : Flood, Flash flood, Rivers, Embankments, Dharma, Health hazards, Kim river basin, Epidemic, Humanistic development.
INTRODUCTION
A flood is an overflow of an expanse of water that submerges land, a deluge. In the sense of "flowing water", the word may also be applied to the inflow of the tide.

An overflow of water from a lake or other body of water due to excessive rainfall or other input of water which takes away lives of hundreds and thousands of people as it has shown this year in its most devastating forms in Bihar as well as destroying property of lakhs and crores. The most affected are poor like farmers and our own economy.

A flood that rises and falls rapidly with little or no advance warning is called a flash flood. They are usually the result of intense rainfall over a relatively small area. Streams and rivers periodically flood and the adjacent dry lands that are covered are called flood plains. The main causes of floods are heavy rains and fast-melting snow masses. Coastal areas are occasionally flooded by unusually high tides caused by severe winds over the ocean surfaces, or by tsunamis resulting from undersea earthquakes. Coastal flooding can also be caused by intense rain squalls that accompany a hurricane.

The human invasion from the start of civilization has contributed a lot that has intervened in the natural course of environment. The activities such as construction of houses and deforestation have resulted in the erosion of soil that has made the land more prone to changing environment with a deteriorating effect.

On the same hand with the development in environmental jurisprudence, the law has evolved with set of rules providing a guideline to the people to minimize the ill effects of the environment that may be caused due to calamities such as floods.

Most of the discussions on environmentalism in our country begin with the Stockholm Conference (1972). But, some ancient texts tell us that our society paid more attention to protecting the environment than we can imagine. These texts tell us that it was the dharma of each individual in society to protect Nature, so much so that people worshipped the objects of nature, trees, water, land and animals had considerable importance in our ancient texts; and the Manusmriti prescribed different punishments for causing injury to plants. Kautilya is said to have gone a step further and determined punishments on the basis of the importance of a particular part of a tree.1

Floodwater can seriously disrupt public and personal transport by cutting off roads and railway lines, as well as communication links when telephone lines are damaged.

Floods disrupt normal drainage systems in cities, and sewage spills are common, which represents a serious health hazard, along with standing water and wet materials in the home. Various health hazards in the form of bacteria, mould and viruses, cause disease, trigger allergic reactions, and continue to damage materials long after a flood as a continuing effect of the floods.

Floods can distribute large amounts of water and suspended sediment over vast areas, restocking valuable soil nutrients to agricultural lands. In contrast, soil can be eroded by large amounts of fast flowing water, ruining crops, destroying agricultural land / buildings and drowning farm animals.

Unfortunately, flooding not only disrupts many people’s lives each year, but it frequently creates personal tragedies when people are swept away and drowned.

Objective
The objective of this research paper is to deal with the causes and effect of flood on the environment and ways to combat the disaster through the Disaster Management programs.
The paper has covered general information regarding the situations that gives rise to floods and discusses about the problems faced by the people especially those living in the remote areas.

Examples have been given of the recent flood in parts of Bihar in the year 2008 and the environmental change taking place in Gujarat.

Further the paper also lays stress on the importance of judiciary as a law interpreting body for the protection of environment through environmental laws. Important principles laid in the conventions have been cited as a supplement to these environmental laws.

**METHODOLOGY**

The research paper on is based on doctrinal sources of research.

**Sources of Data** The following secondary sources of data have been used in the project :

1. Books
2. Journals / Articles
3. Internet websites

**Method of Writing** : The method of writing followed in the course of this research paper is primarily analytical.

**Mode of Citation** : A uniform mode of citation has been followed throughout the course of this research paper.

**RESULTS AND DISCUSSION**

**Social consequences**

Flooding accounts for an estimated 40% of all natural disasters. The social impact of floods primarily encompasses damage to homes and displacement of the occupants that may, in turn, facilitate the diffusion of a virulent strain of bacteria because of cramped and crowded living conditions and less than adequate personal hygiene. As this year the most devastating form of flood in Bihar by the river Kosi had displaced and marooned more than 30 lakh people. Sanitation had been one of the major problems for the flood affected areas as most of the people are residing on the roads and embankments. There are chances of epidemic among the animals due to stagnation of water. As a result of flood there remains no crop in the affected areas and as most of the affected people are marginal farmers or agricultural labourers, they do not even get any opportunity for their livelihood.

The construction of embankments leads to change in the natural course of river and therefore the river characteristics and flow conditions are bound to change. There are opposite views on the issue of construction of embankments as flood control measures. Various studies conducted regarding performance evaluation of different embankment systems shows that the merits and demerits varies from case to case and cannot be generalized. By confining the flow within the embankments, the flood plain storage is prevented and the total discharge is constrained to flow within the confinement. This increased discharge leads to increase in velocity and water level. All these changes, in turn, affect the river channel geometry, longitudinal profile and river morphology. The country side drainage is also prevented giving rise to the problems of drainage congestion at the junction of tributaries.

Flooding is associated with an increased risk of infection, however this risk is low unless there is significant population displacement and/or water sources are compromised. Of the 14 major floods which occurred globally between 1970 and 1994, only one led to a major diarrhoeal disease outbreak - in Sudan, 1980. This was probably because the flood was complicated by population displacement.

Floods in Mozambique in January-March 2000 led to an increase in the incidence of diarrhoea and in 1998, floods in West Bengal
led to a large cholera epidemic. The major risk factor for outbreaks associated with flooding is the contamination of drinking-water facilities, and even when this happens, as in Iowa and Missouri in 1993, the risk of outbreaks can be minimized if the risk is well recognized and disaster-response addresses the provision of clean water as a priority.

Floods may indirectly lead to an increase in vector-borne diseases through the expansion in the number and range of vector habitats. Standing water caused by heavy rainfall or overflow of rivers can act as breeding sites for mosquitoes, and therefore enhance the potential for exposure of the disaster-affected population and emergency workers to infections such as dengue, malaria and West Nile fever. Flooding may initially flush out mosquito breeding, but it comes back when the waters recede. The lag time is usually around 6-8 weeks before the onset of a malaria epidemic. The risk of outbreaks is greatly increased by complicating factors, such as changes in human behaviour (increased exposure to mosquitoes while sleeping outside, a temporary pause in disease control activities, overcrowding), or changes in the habitat which promote mosquito breeding (landslide, deforestation, river damming, and rerouting). Contrary to common belief, there is no evidence that corpses pose a risk of disease "epidemics" after natural disasters. Most agents do not survive long in the human body after death (with the exception of HIV - which can be up to 6 days) and the source of acute infections is more likely to be the survivors. Human remains only pose health risks in a few special cases requiring specific precautions, such as deaths from cholera or haemorrhagic fevers.

However, workers who routinely handle corpses may have a risk of contracting tuberculosis, bloodborne viruses (such as Hepatitis B/C and HIV), and gastrointestinal infections (such as rotavirus diarrhoea, salmonellosis, E. coli, typhoid/paratyphoid fevers, hepatitis A, shigellosis and cholera). The public and emergency workers alike should be duly informed to avoid panic and inappropriate disposal of bodies, and to take adequate precautions in handling the dead.

Beside the health hazards, the effects of flood along with it also include inherently the breakdown of communication link disrupting the life of the people majorly.

**Bihar flood (2008) and the change in environment of Gujarat**

The 2008 Bihar flood had affected the life of the people and devastated them from all the fronts especially the remotely connected areas of Bihar such as the districts of Muzaffarpur, Dabhangha, East Champaran, West Champaran and Saharasa, Araria to name a few.

The 2008 Bihar flood had resulted in a loss of estimated value of damage to public property to about Rs. 2,980.5 million. Under the agriculture sector around 8 million hectares of crop had been affected with an estimated value of Rs. 3,963.7 million.

Beside this, the National Highways had been fully drowned and breached at several places such NH 57 had a long breach, NH 104 had breaches at 19 places and NH 77 had breaches at 40 places. The road communicating to Sitamarhi was completely cut off and the repair work is still going on. Heavy loss had occurred in road network especially in North Bihar due to recent floods affecting the relief work. Road, power and communication infrastructure had become dysfunctional in Madhubani, Darbhanga and Sitamarhi districts but now in some places road communication has been restored.

Considering the health effects then there are increase in the number of diarrhea, kala azar and many cases of snake bites in the flood affected districts. Health infrastructures have been damaged. Some of the PHCs require life saving drugs like ORS, Anti
Snake venom, Anti rabies, drugs for fever, cough and cold. As reported by District Magistrates, now around 560 health centres and 281 veterinary are operating. At least 18 people have died due to Kala azar disease in East Champaran district of North Bihar. Waterlogged houses and cattle-sheds are likely to emerge as a breeding ground for the kala-azar vector and sand fly. Currently 2 UNV doctors are providing health assistance to Sitamarhi/ Darbhanga District.

Flood had its severe impact on the habitat and shelter sector. A total of houses 394,900 have been damaged. More damage is expected once the floodwater recedes from the water logged and submerged places. Most Pucca houses have been washed away near the line of breaches. There is very little flood proofing in the existing structures.

The changed course of the Kosi in Bihar has left many homeless. As claimed by a geologist at the Maharaja Sayajirao University, in the years to come, a similar catastrophe may soon affect Gujarat too. One of the major and independent drainage basins, Kim, may possibly be dangerously changing its course.

The 140 km Kim may change its route due to heavy rains. Its presence in the high tectonic zones between Narmada and Tapi rift systems may also be the reason for its change of course.

“Kim River also shows the pattern of ‘Oxbow lake phenomenon’. It is a crescent-shaped lake formed when a meander of the river or a stream is cut off — near Pansim area in south Gujarat,” said MSU geologist S.I. Vaid. In due course, the Kim could change its sinuous path and start flowing straight due to the high river currents, created either due to heavy rains in the upstream or due to manmade activities, sources said.

“A large amount of data about structural and seismic complexity has been collected by geologists in the area where Kim is located. The river has made a 15-metre incision in Deshad area of Valiya taluka of Bharuch district,” as said by Vaid.

“The zone between Narmada to Bharuch is sensitive because the Indian tectonic plate of south Gujarat is moving towards the north, while the Eurasian plate which starts from Vadodara district is steady. Therefore, a lot of compression is created in the landforms in these areas, which is indirectly affecting the course of Kim which emerges from a hilly terrain,” he added.

The vulnerability of the Kim to floods has been accepted by the district collector of Surat, which too faced an unprecedented flood in the year 2006.

After the 2007 floods in Bihar and Assam, establishment of a national flood commission was discussed. However, India is far from its potential and even further from what is needed on the ground, especially in the case of flood response. Victims repeatedly remain without flood relief or protection. The 2005 floods in Mumbai, the 2006 floods in Surat and Rajasthan, and the 2007 floods in Assam and the 2007 as well as 2008 flood in Bihar demonstrated the need for improved action, accountability to victims and joint performance rating.

The great need to put flood-affected people’s priorities at the heart of flood response was most recently recommended by the people’s commission on the floods in Surat.

Humanitarian agencies—private and public—time and again get into crisis situations in large numbers and often leave the communities they aim to assist undermined. There is tremendous need to do better by actually supporting and facilitating flood affected communities’ own relief and recovery efforts and working alongside government counterparts.

The necessity for the Union government, with state and civil society organization
support, to invest much more in risk reduction and preparedness between two floods is suggested in the Disaster Management Act of 2005 but NDMA has not yet found ways to fund state initiatives. Like other states, Bihar has received national guidelines for flood response but not the matching funds to apply those guidelines.

**International treaties and conventions**

When we talk of the conventions on environmental law the first name that comes in the mind is the Stockholm Conference, 1972 that is supposed to be the key to the environmental conferences. The other key constitutional developments in the environmental law are supposed to be:

- The 1987 Brundtland Report, *Our Common Future*, which coined the phrase ‘sustainable development’;
- The 1992 United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, Brazil

So far as several international treaties and conventions have been made regarding environmental problems like The Earth Summit in the year 1992, The Earth Summit in the year 2002, Johannesburg Declaration, Habitat International Coalition.

**India**

Since ancient times, India has been very much concerned about the environment and its developments as the concept of Dharma is there in the Hindu Jurisprudence. As the Indians also worship the flora and fauna. As also in modern times India is very keen to work for the sustainable development in the field of environment and for that it had been a contracting party to several treaties and conventions. Apart from these treaties the Constitution of India has also specifically mentioned about the sustainable development of the environment, while interpreting Article 21 of the constitution the Supreme Court of India had stated that, the expansive interpretation of “life” has led to a salutary development of an Environmental Jurisprudence in India. In this context the Supreme Court has performed a yeomen service by taking cognizance in a number of cases of various environmental problems and giving necessary directions to the Administration.

On the question relationship between ecology and Article 21, the thinking of the court is that since the Right to life is a Fundamental Right as mentioned under Article 21, and as right to life also means “quality of life.” As mentioned in the case of *M.C. Mehta v. Union of India*¹, the Supreme Court ordered closure of tanneries which were polluting water. In the case of *Vellore Citizens Welfare Forum v. Union of India*², the Court took cognizance of environmental problems being caused tanneries which were polluting all water resources, rivers, canals, underground water and agricultural land. The Court issued several directions to deal with the problems. In another case of *M.C. Mehta(2) v. Unoin of India*³, the Supreme Court has held that under Article 51-A(g) it is the duty of the central government to introduce compulsory teaching of lessons at least for one hour in a week on protection and improvement of natural environment in all educational institutions of the country. It also directed the government to get text books written on that subject and distribute them to the educational institutions free of cost.

**CONCLUSION**

Floods can damage and destroy property. They endanger the lives of people and animals. Flooding currents erode the flood plains and carry and deposit sediment downstream. The habitat of fish and other wildlife are often destroyed. The financial loss due to flooding amounts to millions of dollars every year. Many of the methods used for flood control have been practiced since ancient times including afforestation, and the construction of levees, dams and reservoirs, and flood channels to redirect floodwater.
The state should put forth its best effort to minimize the circumstances of floods. The judiciary has played a commendable role in ecology and environmental preservation and is also taking care of the need to have development under article 21, article 48-A and article 51 A(g) of the constitution. The Gandhian philosophy emphasizing that “nature has provided everything for our need but not for greed”. It is a constant source of reminder for maintaining a fine balance between humanistic development and environment.

RECOMMENDATION

The protection against floods can be done by way of construction of embankments, drainage channels, town protection works and raising on platforms. What is also required is putting the water resources on the concurrent list to ensure a holistic approach and not a politically biased one also one need to opt for personal disaster Management methods.

Disaster Management programs should be run with vital force to meet out the challenges caused due to flood. The State government can divide the work of relief work between the local sectors and should call upon organizations such as NGO’s to help the affected people. Committees should be founded that keeps the complete detail of the affected regions and coordinate in the proper distribution of food materials and other necessities required by the people affected.

In view of the frequency of natural disasters in the country, a well-structured and integrated disaster administration mechanism has evolved over the years. Besides, a number of organizations who supplement the efforts of the government at Central, State District levels provide vital input during emergencies and for preparedness and rehabilitation measures have also been now being institutionalized.

Based on the identified types of NGOs and their capabilities, and other bodies of the government such as State crisis management group, district relief committee can be very useful in the following activities in different stages of disaster management. Awareness and information campaigns, Training of local volunteers, Advocacy and planning during pre – disaster period. During Disaster actions such as Immediate rescue and first-aid including psychological aid, Supply of food, water, medicines, and other immediate materials, Ensuring sanitation and hygiene, Damage assessment. Lastly, Technical and material aid in reconstruction, Assistance in seeking financial aid and Monitoring after the disaster period.

In disaster situations, a quick rescue and relief mission is inevitable, however considerable damage can be minimized if adequate preparedness levels are achieved. Indeed, it has been noticed in the past that as and when attention has been given to adequate preparedness measures, the loss to life and property has considerably reduced.

REFERENCES