



Effects of Flood Problem and Its Solutions in India

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Abstract

India is a large populated country in the world. Its rank seventh in area in world. There are different rivers and their tributaries are flows in most part of India so the flood is the major problem in India. This natural hazard created another major problems in India. Our earth is a combination of different natural systems and complicated things which are affected on human life. Before the past many years when the human life is started on earth there are so many problems and crises are occurred on earth surface. Events such as volcanic eruptions, earthquakes, landslides and floods are a part of natural systems and these are the example of geophysical events. If we give a took attention on all natural disasters then we find that floods are the most extensive and devastating disaster on our earth surface. So when we talk about a flood the most common images that come in our mind are disaster and problems which are facing many parts of the earth surface and also in India. This is the common thinking for floods, but floods also have some beneficial qualities such as bringing fertile clay, flushing away pollutant and contaminants by refreshing underground water banks.

Keywords: Flood Problems, Flood effects and management, Flood control Solutions

Introduction

Floods are among the most damaging of natural hazards, and are likely to become more frequent, more relevant and more damaging in the future due to the effects of increase in population, urbanization, land subsidence and, to a certain extent, the impacts of climate change. The nature and occurrence of floods are governed by diverse factors, including rainfall characteristics, properties of the drainage catchment of land and water use and management in the catchment. The terms flood and flooding are often used in different ways. Flood is defined as the overflowing or failing of the normal confines of a river, stream, lake, canal, sea or accumulation of water as a result of heavy precipitation where drains are lacking or their discharge capacity is exceeded.

Objective: To study the Flood Problems and their solutions in India.

Research Methodology

This research paper is based on secondary information. In this research paper the data has been collected from various secondary sources like research papers, newspapers, journals, magazines, articles, libraries and secondary sources. Information is also processed and presented in theoretical base.

Major Rivers and Flood Problem in India

Out of the country's total geographical area of 329 million hectares about 45 million hectares is flood prone area in India. The rivers in India can be

broadly divided into the following four major regions for a study of flood problem in India.

1. Ganga River
2. Brahmaputra River
3. North West Region
4. Deccan trap region

1. Ganga River:

The Ganga is one of the major river in India and this river Ganga and its numerous tributaries, of which important ones are the Yamuna, the Sone, the Ghaghra, the Gandak, the Kosi and the Mahananda, constitute this river region. It covers ten states of Uttaranchal, Uttar Pradesh in its basin area, Jharkand, Bihar, South and Central parts of West Bengal, parts of Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh and Delhi. The normal annual rainfall in this region varies from 60 cm to 190 cm of which more than 80% occurs during the south west monsoon. The rainfall increases from West to East and from South to North. The flood problem is mostly confined to the areas on the northern bank of the river Ganga. The damage is caused by the northern tributaries of the Ganga by spilling over their banks and changing their courses. In the North Western parts of the region and some eastern parts, there is the problem of drainage congestion.

2. Brahmaputra River:

This region consists of the rivers Brahmaputra & Barak and their tributaries covering seven states Assam, Arunachal Pradesh, Meghalaya,

Mozoram, Northern parts of West Bengal, Manipur, Tripura and Nagaland. The catchments of these rivers receive very heavy rainfall ranging from 110 cm. to 635 cm. a year which occurs mostly during the months of May and June to September. As a result, floods in this region are severe and quite frequent. Further, the rocks of the hills, where these rivers originate are fragile and susceptible to erosion thereby causing exceptionally high silt charge in the rivers. In addition, the region is subject to severe and frequent earthquakes which cause numerous landslides in the hills and upset the regime of the rivers.

3. North West Rivers:

The main rivers in this region are the Sutlej, the Beas, the Ravi, the Chenab and the Jhelum, the tributaries of Indus, all flowing from the Himalayas. These carry quite substantial discharge during the monsoon and also large volumes of sediment. They change their courses frequently and leave behind tracts of sandy waste. The region covers the State of Jammu and Kashmir, Punjab and parts of Himachal Pradesh, Haryana and Rajasthan. Compared to the Ganga and the Brahmaputra river region, the flood problem is relatively less in this region.

4. Deccan Trap Rivers:

This part is also called central part of India. The important rivers in this region are the Narmada, the Tapi, the Mahanadi, the Godavari, the Krishna and the Cauvery. These rivers have mostly well-defined stable courses. They have adequate capacity within the natural banks to carry the flood discharge except in the delta area. The lower reaches of the important rivers on the East Coast have been embanked, thus largely eliminating the flood problem.

Solutions on Flood Problem in India

Following are the major solutions of flood problem in India

1. Channelization of Rivers in India

Some of the states are proposing channelization of rivers, at least in certain reaches, in the context of tackling the extensive meandering problems of the rivers, activating navigational channels and training these rivers into their original courses. While venturing to channelize rivers, thought must be given in allowing the river certain freedom to flow and right of way to pass its flood waters and silt load within its natural waterway. The dynamic nature of the rivers should be appreciated and preventive measures planned accordingly instead of pinning down the river by channelizing.

2. Channel Improvement

The method of improving the channel by improving the hydraulic conditions of the river channels by desalting, dredging, lining etc., to enable the river to carry its discharges at lower

levels or within its banks has been often advocated but adopted on a very limited extent because of its high cost and other problems. Dredging operations of the Brahmaputra, which were undertaken in the early seventies on an experimental basis, were discontinued because of their prohibitive cost and limited benefits. Dredging in selected locations may perhaps be considered as a component of a package of measures for channel improvement to check the river bank erosion subject to techno economic justification.

3. Watershed Management

The watershed management measures include developing and conserving the vegetative and soil covers and also to undertake structural works like check-dams, detention basins, diversion channels, etc. In the watershed management of upper catchment, land treatment through afforestation and grass land development practices should be supplemented by structural works for retarding the water velocity and arresting silt.

4. Diversion of Flood Waters

Diversion of flood waters takes a part of the flood discharge to another basin or to the same basin downstream of the problem area or to a depression where it could be stored for subsequent release. This measure can be used to manage unusual floods around cities as in the case of flood spill channel near Srinagar and also in the lower reaches of a river near the sea as in the case of Krishna Godavari drainage scheme. Important schemes under execution or under planning are the supplementary drain in Delhi, the outfall channel in Jammu and Kashmir, the Damodar in the lower reaches in West Bengal.

Reservoirs.

Reservoirs can moderate the intensity and timing of the incoming flood. They store the water during periods of high discharges in the river and release it after the critical high flow condition is over, so as to be ready to receive the next wave. Their effectiveness in moderating floods would depend on the reservoir capacity available at that time for absorbing the flood runoff and their proximity to the likely damage centre. The Ghaggar detention basin in Rajasthan is a good example.

Embankments

Embankments are designed and constructed to afford a degree of protection against floods of a certain frequency and intensity or against the maximum recorded floods till the time of their planning only depending upon the location protected and their economic justification. Expenditure has been incurred in the past. The embankments, under serious attack by the major rivers and their tributaries, have to be suitably protected by spurs, pitching and other suitable anti-erosion measures.

On many embankment systems like the Kosi embankment and Pipraghat embankment on the Gandak in Bihar, the river attack is so severe that the protection measures required to be taken are large and cannot be covered under the normal maintenance works. Some embankments have provided positive benefits by ensuring sustained protection against floods and river spills while on the other hand, some embankments have, in certain reaches of the river, aggravated the flood problem by rising river bed levels, decreasing their carrying capacity, causing drainage congestion in the countryside and distorting the levels/gradient of the outfall points.

Conclusion

Flood in India has become one of the biggest disaster which has killed thousands of the people in last few years. The recurrence and intensity has amplified over the time which damaged life and economy at a great extent. Government of India has taken up many measures to lessen the damage caused by flood and other disasters, but there is a long way to go. Use of science and technology, telecommunication and media for alarming and pre-disaster measures can be effective to reduce the devastations. To set up alarming system at the bank of rivers which can alert neighboring dwellers about rising water level can also be an effective measure to minimize the damage. Along with it, awareness programmes and preparedness campaign at the flood affected areas can help in limiting losses. Rehabilitation of the neighboring community to a safe and higher place before flood arrives can reduce the danger to life. Quick action in supply of goods and services like medicine, food and water supply helps in quick recovery and limited loss after the disaster. Analysis of flood trend and damage caused by it suggest that there is a need for effective pre-and post-disaster mechanism as the nature cannot be checked but disaster can be reduced.

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