

Causes of Floods: A Case Study of Jalpaiguri District

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Abstract:

Throughout the human civilization, floods have been part of his destiny. Presently there are widely discussed of disasters and its results to enhance the public awareness and greater destruction caused by disaster (flood). Perhaps, flood is one of the most dramatic interactions between man and his environment. The sub-Himalayan West Bengal is experiencing the number destructive floods as the enumerable rivers of Sub Himalayan region are coming from different sources Himalayas lakes and snows which makes the rivers has always been liable to floods. The main reasons are the high floods are excessive rainfall within small duration in small catchments and continuous rainfall of several days in bigger catchments. The simultaneous melting of snow accumulated on high mountains and rainfall in lower reaches often caused floods of devastating nature (Sarkar S. et al. 2004). North Bengal is highly patches with an intensive network of river systems. Jalpaiguri district is highly affected due to the floods of this river which is mainly occurred by extensive and regular bank erosion, course shifting, snow melting, and drainage patterns. Thus the present paper is focusing on the causes of floods in Jalpaiguri district.

Key words:

Flood, Forest fire, Deforesting, Landslide, Urbanization, Flood mitigation.

1. Introduction:

Jalpaiguri district is the divisional head quarters of North Bengal. Due to the mountains on the north part, Jalpaiguri district are receiving incessant rain. The rain water has swelled the rivers coming out of the Himalayan mountains. A flood is an overflow of water that submerges land that is usually dry. In the Jalpaiguri district, due to its topographically low lying situation always had been affected by floods.

2. Objectives:

The objectives of the paper is-

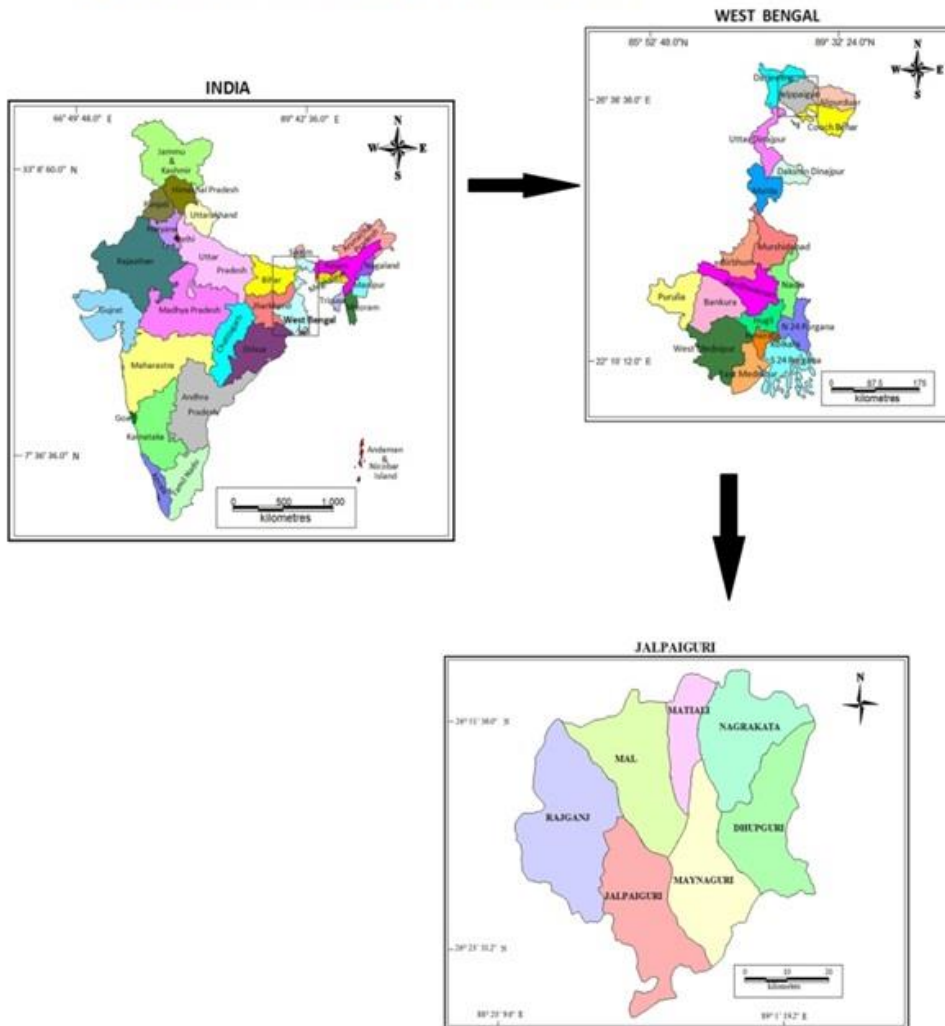
- To highlighting the causes of floods in Jalpaiguri district of Sub Himalayan North Bengal.

3. Study area:

The study area comprises districts of Jalpaiguri, West Bengal bounded by the latitude of 26°15'47" to 26°59'34" North and longitude of 88°23'2" to 89°7'30" East. The region covers an area 3386.18 sq.km. The total population of the district is 2381596 persons (2011). The district situated in the northern part of West Bengal has international border with Bhutan and Bangladesh

in the north and south respectively and district borders with Alipurduar and Cooch behar and the Darjeeling hills in the east, west and northwest.

Figure 1: Location Map of the Study area



Source: Jalpaiguri Municipality

4. Data base & Methodology:

To prepare this paper, different data has been collected from primary and secondary sources.

5. Discussion:

Jalpaiguri district is endowed with an intensive network of river systems. Most of the rivers are considered to be highly notorious for their unpredictable nature. By this floods thousands of people are facing homelessness during the rainy season. As many of the rivers originate from the Sub Himalayas like Tista, Torsa, Jaldhaka etc. they often create floods and the Jalpaiguri district is affected very much for it.

6. Causes of floods:

The main causes of floods in Jalpaiguri district over the past decades are -

6.1. Over grazing:

The rules and regulation of grazing rights, privileges, and concessions for forest produce, Minor timber etc, are generous and vary from state to state. Forest regulations admit such rights. Tribal

people in state have their free rights to grazing and extracting minor forest produce. Overloading degrades the watershed sediment discharge (like Jalpesh, Tista spur etc) and overland flow volume increase from such degraded catchments. The situation becomes more acute in places where livestock population is very high. Some areas are having this problem of the district and the upper catchments of the main rivers of the Jalpaiguri district facing the problem. This is the major problem of floods in Jalpaiguri district.

6.2. Deforestation:

Deforestation has several environmental affects like air pollution, soil pollution, Climatic change and soil erosion etc. But flood occurrences are very prominent due to the deforestation in the upper and lower catchments of the river basin in the recent years. Jalpaiguri district is famous for the vast forest tracks and for their luxuriant growth of natural vegetation is facing the problem of large scale deforestation or forest clearings due to the expansion of agricultural lands, tea gardens, roadways, railways, rapid urban isotones or settlements etc. these causes landslides, sheet erosion, slope failure and top soil erosion in the upper catchment areas of the leading river of the district, which enhance the debris flow and large scale sedimentation in the riverbeds of all the rivers of the district and acute the flood problem of the district. This reckless deforestation also affects the climate of the study area.

6.3. Surface Mining:

Large scale surface mining of minerals for manufacturing of cement and especially for the extraction of dolomites in the Bhutan hills make radical change in river behavior of the Jalpaiguri district. It is noticed that spilling and massive sand and debris deposition in the multi-cropped agricultural field. This has caused national loss in term of the agricultural and tea productivity and also has adverse effects to the people residing in the adjacent area. Chamurchi-Reti-Pagli area is the worst affected by this problem followed by Chamurchi-Reti-Pagli Makrapara-Lankapara area (Starkel, L & Sarkar, S, 2002).

6.4. Forest fire:

Forest department have a practice of administering regulated fire in moist regions for encouraging natural regeneration of teak (*Tectona grandis*), sal (*Shorea rebusta*), deodar (*Cedras deodars*) etc. This is mostly done to check the growth of evergreen tree, shrubs and woods, reduce depth of leaf litter and create a conducive site for the germination and establishment of seedlings. However, the unregulated wild fires are fraught with danger for defecating watershed conditions. Such incidences are numerous. They damage the soil and rob the forest of its productive and protective capacity hence, the normal hydrological functioning of the forest watershed gets upset.

6.5. Landslides:

Compared to the mountains in the Deccan plateau or central India, the Himalayan ranges experience serious landslides. No systematic or reliable data are available on the extent of the problem and the amount of sit contributed from this source. With the increasing activities of road

construction in the Himalayan region, road engineers annually face the land slide problems for clearing the debris and keeping the roads open (Sarkar, S., 1991 ;Starkel Let. al., 2000). Therefore, the volume of debris contributed by the slides along the Himalayan roads may furnish a first approximation of the silt estimates contributed from this source, though numerous landslides occurring in inaccessible areas will remain beyond any possible estimation. Under the circumstances, an effort may be made to give a partial view of the serious problem of land slide infesting the entire stretch of the upper catchments of the flood prone rivers of the Brahmaputra river systems. Due to its characteristic geological formations and being in the seismic region, the problem in the upper catchments is however, quite complex.

6.6. Rapid urbanization:

Rapid urbanization in the Jalpaiguri district is experienced since long back. Jalpaiguri town is a divisional town from the British period and the district as a whole is well connected with Bangladesh before partition. After independence the district witnessed huge infiltration from Bangladesh. It is most important factor for the rapid urbanization in the district. The towns of the district are also very closely spaced like Jalpaiguri, Maynaguri. Dhupguri. Falakata. Malbazar. Hasimara. Nagrakata. Goirkata. Binnaguri etc nether important factors are huge potential of tourism in the Duars region development of tea (1ardens. bordering areas of Bhutan and Assam, normal population growth and army bases make rapid growth of urbanization of the district). This urbanization process leads large scale deforestation because forest lands are been encroached by the people which enhance the soil erosion, bank erosion and other problems and ultimately encourage the flood problem. People also encroaches the flood plain and during normal floods the situation became vulnerable.

6.7. High intensity rainfall:

High intensity rainfall is the mother of all problems particularly the flooding of the Jalpaiguri district. Sudden maximum downpour creates the situation of flood in the district. The nature of the flood is mainly flash flood. Cloud burst or maximum rainfall in a short span always aggravate the situation of flooding in the district since long past. The flood history of the district gives no clear conception of because that is high intensity rainfall or cloud burst is the main cause behind the major floods of the district. Floods of 1922 are due to cyclonic rainfall in one week was about 10 times of the normal rainfall and other Major floods are 1954. 1968. 1993. 1999 and 2000 and 2017 all are caused due to unprecedented high intensive rainfall.

6.8. Shifting of river courses:

This is the most significant hazard of the district. Avulsion is often found in the foot hills and Duars area of Jalpaiguri district. Avulsion not only causes the floods of severe nature but also

defoliates the flood situation and flood havoc of the district significantly. Shifting of river courses in the Jalpaiguri district is so often due to the rise of river bed levels high deposition of silts and coarse materials in the river beds, soil erosion and landslides in the upper catchment of the rivers and bank erosion. Rivers are very closely flowing in the district. So the lateral gap of the rivers of the foothill areas is very small and the river coalesces makes the shifting quite normal. Shifting of the rivers creates prolonged flood condition and gave birth of the high magnitude of flooding and havocs. River Tista, Jaldhaka, Sankosh, Torsa and many other rivers shifted their channels in the past.

6.9. Construction of road and railway bridges:

This is also a factor for the flooding in the district. The narrow road and railway bridges spanning the rivers as well as the pillars supporting them are always considered to be barriers interrupting natural load movement behavior of the rivers. This often causes accelerated deposition at the bottom of the bridges and thereby narrowing the outlets of the river gradually. Such constrictions, sometimes due more to the entanglement of uprooted trees to the voluminous flows of the flood often multiply its effects many times damaging the bridges, human habitations and farm lands.

6.10. Continuous encroachment by the people:

Huge encroachment of the forest land and flood plains mainly vulnerable areas of the district causes huge damage in the floods by the people day by day due to the increase in population development purposes infrastructural needs tourism and for defense purposes huge encroachment is noticed. Encroachment of the forest land degrading the situation of soil erosion and large scale debris flow and encroachment in the flood plains restricts the river flow of the region. Sometimes in the monsoon period normal discharge causes flood because rivers are not hampering the habitation but the habitation disturbing the normal river flows.

6.11. Drainage congestion:

Here the network of the drainage is very high and the lateral gap between the two rivers is very less in this region. Only 3 to 30 Kms. are the lateral gap of the rivers in this district. So, rivers are very closely spaced which may create a problem of the river coalesces in the floods or heavy discharge in the rainy season.

Conclusion:

From the very early, Jalpaiguri district was treating by number of floods. Environmental degradation i.e. forest fire forest cutting, extremely snow melting is a major problem which makes the rivers more vulnerable for disrupting the Jalpaiguri district. It is therefore, became a

great issue to survive the present position of livelihood against such floods. Though, there are number of Anti-degradation process or Flood Mitigation plant already set up in Sub Himalayan North Bengal region to protect the human civilization but awareness of people is the main key factor to reduce this hazard.

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