Vol II Issue IX

ISSN No : 2230-7850

Monthly Multidiciplinary Research Journal

Indian Streams Research Journal

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RNI MAHMUL/2011/38595 **ISSN No.2230-7850**

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

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Indian Streams Research Journal
Volume 2, Issue. 9, Oct 2012
ISSN:-2230-7850

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ORIGINAL ARTICLE

Degeneration Of Rivers In Murshidabad: Probable Causes

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Abstract:

The rivers of West Bengal are decaying at a fast rate. About twenty five rivers have become moribund and sluggish during last few centuries. Some of the moribund rivers are Gobra, Bhairab, chhoto Bhairab, Jalangi, Mathabhanga- Churni, Ichhamati, Noai, Suti, Bidyadhari, Adiganga, Piyali, Kana-Damodar, Maja-Damodar, Gabgur, Behula and Banka. The decay of rivers can be attributed to excessive sediment load, diminishing headwater supply, tidal intrusion, expansion of agricultural land and many other unscientific human interventions into the river regime. The present study has been presented as a qualitative analysis. It is found from the study that along with the natural siltation there are human interventions in the river regimes which cause the decay of rivers in Murshidabad.

KEYWORDS:

Degenration, River, Quantity, Findings.

INTRODUCTION

A river not only drains its basins but also carries along with the water a large amount of sediments and molten minerals from the lands it washes and levels in its upper reaches. The character and quantity of such sediments will depend on the character of the catchment and the areas through which it passes. Heavier parts of these sediments like boulders and gravels and coarse grained sands get dropped long before the river approaches the sea. The lighter parts of these sediments like silts and fine sands the river goes on collecting and distributing along its way, particularly in areas where the river overspills or inundates because of the shallowness of its channels or lowness of its banks or the existence of distributaries or spill channels in those areas. Thus it contributes to the building of those areas as fertile floodplains by depositing layers of rich alluvium. Agriculturally these lands are so rich and lucrative that the ever-present risk of recurring floods cannot dissuade people from flocking there in ever greater numbers. However the most important part of its building activity the river reserves for the final phase of its long journey. Here the slope gets less and less steep and the channel becomes wider and deeper. If at the place where it meets the seas the continental shelf does not drop sharply and its slope is gentle, the ocean currents are not strong and the tidal actions, particularly in bay areas, act as a considerable barrier the flow of the river becomes sluggish and it deposits its silts and sediments in heavy quantities, raises its own bed, blocks its own way, breaks this new land and bursts its own banks to find a new channel and gets split up into many.

OBJECTIVES AND DATABASE

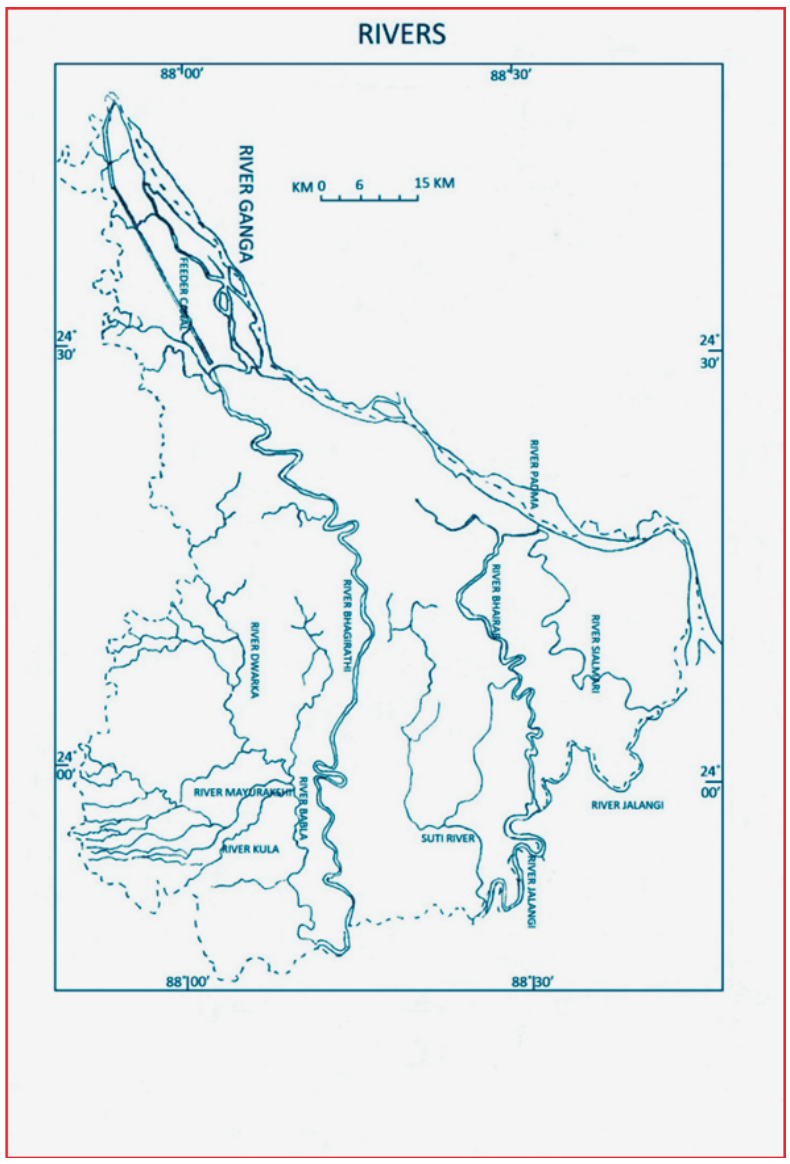
The main objectives of the study are as follow:

1.To find the probable causes behind the degeneration of spill channels of Ganga River in Murshidabad

Please cite this Article as :Swati Mollah , Degeneration Of Rivers In Murshidabad: Probable Causes : Indian Streams Research Journal (Oct. ; 2012)

district of West Bengal. and
2.To describe the flood hazard problems related with the decaying of spill channels of the Bagri Region of Murshidabad.

Both primary and secondary data are used. A number of field surveys were conducted to the courses of these spill channels of Murshidabad for detail study of their present conditions. Secondary data sources are published sources such as- Murshidabad District Gazetteer, Publications of Higher Education Department, Report of Flood Preparedness & Management Plan, Bureau of Applied Economics and Statistics.



STUDY AREA

Murshidabad is located centrally in the lower Ganges Valley. The river system consists of the Ganga and its distributaries, of which the most important are the Bhagirathi, Jalangi and Bhairab. Formerly large rivers with an active current, they are now merely spill channels of the great river, which during the rains carry off a portion of its flood water, but for the remainder of the year have a very sluggish current. The streams are incapable of carrying the large quantity of silt they received, so that shoals form and impede navigation. The rivers in the east of the district are fed to a certain extent during the dry season by infiltration

from the Ganga. Where the river is broad, and large islands or chars are thrown up, the volume of its discharge is affected by the portion of the stream which thus passes away through the sand. The eastern tract between the Bhagirathi, the Ganga and the Jalangi is in no way different from ordinary alluvial plains of Bengal. The whole area lies low and is exposed to annual inundations which sometimes cause much suffering. Spill channels of Ganga/Padma used to carry surplus water of rainy season and were well connected with a number of bils forming a network of water communication. But with time they become virtually dead.

FINDINGS

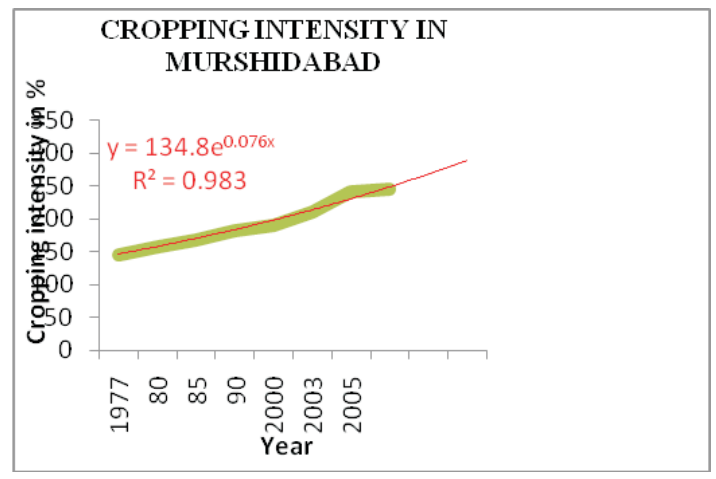
The sediment movement in tidal estuary of the Hugli is the function of a complex fluvial system that can hardly be governed by inducing 40000cusec (1132 cumec) of water. An estimate based on the Tide Tables for 2004 published by Kolkata Port Trust reveals that during the high tide in May total amount of water induced into the estuary varies from 2559 - 6790×106 m3 with the sediment load ranging from 2.60 - 6.80×106m3 ton. A similar estimate during August-September shows those to be1857-6813×106 m3 and 1.86 - 6.81×106 m3 ton respectively. The south flowing peak discharge in the Hugli even during monsoon hardly exceeds 4246 cumec only. This has also important role in degeneration of deltaic rivers. The sediment movement in the estuary is tide dominated and that can push back 4.90 to 14.67 ×106 tons of sediment each time. One major reason of increasing sediment load in the river is the depletion of forest cover, expansion of agriculture in the catchment areas and increasing bank failure in Murshidabad in Nadia districts. Since the construction of a series of dams across the western tributaries, the peak discharge in the Bhagirathi has been reduced and thereby the ability to flush the sediment towards the deeper sea has declined.

The diminishing headwater supply and increasing sediment load posed serious challenge for navigation also. The catchment areas of the western tributaries to the Bhagirathi have been drastically modified during last two centuries. The hydraulic regime of this area was largely modified due to expansion of agriculture, indiscriminate exploitation of ground water, depletion of forest cover, expansion of road and railways and building of dams and barrages across the rivers. All these events were combined to contribute increasing sediment load and diminishing water in the Bhagirathi-Hugli River. Since the dams had been built across some of the western tributaries, the peak discharge of the Bhagirathi has been reduced. This in turn affected the ability to flush the sediment load into the sea.

Most of the off takes of these spill channels have been closed either by man or by nature itself. As a result there is no headwater supply to these spill channels to maintain their original flow and they virtually become dead. On the other hand a little more discharge causes flood in the upstream areas. The off-take of Sialmari has also been closed by construction of a sluice to prevent the flood spill of river Padma. Outfall point of river Bhairab with Jalangi has changed appreciably. The off-take of river Jalangi from Padma has been closed by the Krishnagar- Jalangibazar road embankment resulting in stoppage of entering the flood spill of river Padma into river Jalangi. So the Jalangi-Bhairab-Sealmari area becomes problematic even during normal rainfall.

Plate 1: Decaying of spill channels in the study area. Clockwise from upper left: Confluence of the Bhairab and Jalangi; Off-take of the Bhagirathi; Off-take of the Gobra; Off-take of the Bhairab

One of the important perennial sources of river water is the water-bearing subsoil strata or aquifers, which a river intersects in the course of its journey to the sea. They are like some hidden reservoirs on which rivers depend heavily for replenishment of their supplies. This is the reason why a river does not become quite dry even when there are no precipitations. On an average about 30 per cent of river water is contributed thus by groundwater on a global basis. But in the study areas there is increasing trend of lowering groundwater table which aggravates the problem. So in the winter the rivers become dry.



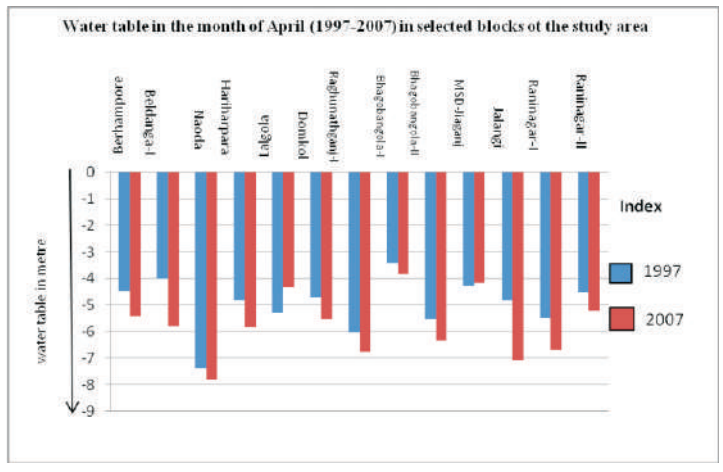


Figure 1.Trend in increasing cropping intensity and lowering groundwater table

Murshidabad is characterized by numerous paleo channels resulted due to frequent changes of river courses. These palaeo channels are now act as wetlands or locally called bils. These bils play important role in the hydrology of the river. On the other hand they acted as sponges to hold the excess water reducing the intensity of floods in the region in earlier times. But the worst destruction has been that of these bils. With increase of population there is a gradual encroachment on originally "empty" ?ood plains by settlements and agriculture. This is also true for areas of bils and swamps that served as natural storage areas for ?ood water as well as supply intermittent flow to the rivers. More than two third of the areas of bils are extensively used for agriculture and settlements in the district. Wetlands in general have been neglected in the study area.

Plate 2. Destruction of bils left: Agriculture practice in Bil right: Natural Siltation of bil

Obstruction in the course of the river without adequate measure has also caused deterioration of the river. Cultivation in river bed and blockage of flow for fishing in different area of the river are common phenomena here causing siltation in the bed and obstruction in the free flow of river.

Plate 3. Obstruction along the river channel

As is generally the other district of West Bengal, Murshidabad has faced a huge increase in population since 1901; the number of people in 2001 was more than four times higher than the number in 1901. Between 1901 and 2001 the increase was gradual and constant, leading to a doubling of the population over a period of 80 years. From 1951 to 2001 the increase was drastic and resulted in a tripling of the population in only 40years. The increase in population, particularly during the second part of the twentieth century, has led to a signi?cant increase in the population density in the ?oodplains of Murshidabad and a decrease in per capita land availability. The average size of land holding per household and availability of cultivable land per agricultural worker are 0.75 and 0.43 hectare respectively. This steep

rise has forced the people to encroach on riverine areas resulting in constricted waterways, increased sedimentation and, in turn, floods of higher intensity.

Plate 4. Human encroachment in the river regime

CONCLUSION

A river requires a certain spill area where it could relieve itself of a portion of its silt which would otherwise deposit in its bed and would gradually deteriorate it. This is very true in the deltaic region where, owing to flatter gradient and consequent less velocity, the river is normally unable to transport its silt burden during floods; and the works carried out in the past in defense of this fundamental principle in river conservancy have not only caused deterioration in the river channels making their maintenance more and more difficult but have also made the very problem of protection against flood damages, which they were intended to solve, more and more acute in the study area.

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