



# The Shifting Courses of The Ganges In Malda : Causes And Consequences - A Historical Perspective.

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## Abstract

Man and environment are related with each other. Therefore, any disturbance caused to the environment leaves consequences on the mankind. From the ancient age, Bengal or the part of Bengal where Malda and Murshidabad were situated faced various challenges from the changing course of the Ganges under various rulers. With these changes in the river course, the landscape of the affected area changed and this became a continuous process. This paper will try to show how from mid-12<sup>th</sup> century, river Ganges has shifted its course at various point of time in the study area. This has led to severe erosion. Particularly after the construction of the Farakka Barrage, it has been intensified. Construction of the Barrage is a manmade factor that has contributed to the environmental hazard. This has left huge impact on the life, culture, mind of the people. So this shows clearly how environment can harm human life at its wish. It is important to mention also that the nature of human interaction with environment often leads to their sufferings.

However, the tragedy is that the erosion and consequent problems of the life of the people has been continued through years. No change has been or could be made in order to control the problem of erosion or reduce the suffering of the people. In other word, it has been made clear that no power, whether of science or technology can tame the flexibility of nature.

## Data sources

In this study, both primary and secondary data have used to understand the overall historic scenario of Ganga. The primary data includes observation from the field survey, interview with the respondents and focus group discussion. The data related to secondary sources include comprehensive literatures survey. The research works carried out over the region have been taken into account in the literatures survey.

**Keyword** : Changing Course, Ganga, Shifting Courses, Bank Erosion, Natural and Man-made Factors.

The lower course of the Ganges starts from the Rajmahal hills in Jharkhand State (Eastern India) and ends at the Confluence of the Bay of Bengal. From Raajmahal, the river has flown southwards and in the Murshidabad District of West Bengal, near Dhulian - Ganga's first distributary Bhagirathi-Hooghly gets branched out (the other branch enters into Bangladesh as Padma). This Bhagirathi-Hooghly has gone through West Bengal and going southwards meets the Bay of Bengal. In the first 260 km. the distributary of Ganga flowing southward entirely through India has the name Bhagirathi. From the point of confluence between Bhagirathi and Jalangi at Mayapur in Nadia district, till the estuary, the stretch has the name Hoogly. The

total length of this distributary will be called Bhagirathi-Hoogly. Thus, West Bengal is located in the lower course of the river Ganges which has got 520 km length of the river but it is significant that from the last half of the 18th century the main course of Ganga has lost connection from Bhagirathi.

The district of Malda is located at the adjacent portion of the northern and southern part of West Bengal in the lower basin of the Ganges. The districts surrounded by Bihar and North Dinajpur in the north, Murshidabad in South, Bangladesh in East and Jharkhand in the west. About 76 kilometre of the river-length has been flown through Malda situated on the left Bank of the Ganges.

From the ancient age, Bengal or the part of Bengal where Malda was situated, faced various challenges from the changing course of the Ganges under various rulers. The Senas came to power in Bengal in Mid-12th century. The new Sena capital was built at Lakshmanawati (later Lakhnauti) on the west bank of the Ganges, which then flowed along the channel below English Bazar. The site of this old city was the same as of Gaur (the later capital of Bengal) which Lays to the south of the present town of Malda now (2022). However, when the Ganga began to show a tendency to migrate westward during the late years of Sena rule, Lakshmansena was forced to shift his capital southwards to Nuddeyah (possibly modern Nowdah in Murshidabad). During the later period of Khalji rule, following the defeat of Senas by Bakhtiyar in 1205, an embankment was built along the west bank of the Ganga by Iwaz Khalji to halt the further advancement of the river<sup>1</sup>. It shows how disturbed was the people by the haphazard movement of the river.

Consequently, Alauddin Ali Shah made Pandua the capital in 1342. Mahananda, an important tributary of the Ganges, used to flow by Pandua. It began to shift westward later. Thus, in this process Pandua lost its navigational access, thus was abandoned gradually. After that, the capital was shifted to Gaur in Mid-15<sup>th</sup> century during the reign of Nasiruddin Mahmud Shah<sup>2</sup>. It continued to be there for the next 100 years. The main flow of the Ganges, by this time had shifted from the east of the city to its west, leaving only a few intermediary channels that linked the Mahananda with Ganga.

Gaur gradually extended south-eastwards from the older site of Lakhnauti and as a new capital was at the peak during the time of Hussain Shah. By this time, it had become a major centre of Gangetic River trade also. Portuguese visitors who came to the city in the early sixteenth century saw a busy river Port by the side of the city. Favoured geographically by the vicinity of river and the existence of river-port, Gaur enjoyed the facilities of trade and rich economy. However, after Sher Shah conquered Gaur, this major mediaeval city began to decline. But what is important to mention here is that the river migration was resumed and that contributed largely behind the fall of this city. Though, for a brief period between 1565- 1575, Gaur could regain its earlier status of capital, but the old or almost dead drainage channels which became moribund by then, invited epidemics. The frequent recurrence of plague around this time called for the end of this ancient city.

However, in 1595 Man Singh, the then Subahdar of Mughals decided to build a new capital for the Mughal Subah of Bengal at the new upriver site of Rajmahal (in Jharkhand now), on the west bank of Ganga. Initially the location of new capital at Rajmahal or Akbarnagar was favourable, because of its accessibility by the river and natural protection given by the Rajmahal Hills to it. However, despite a temporary shift of the Subah Headquarters, Shah Shuja shifted the capital of the Subah back to Rajmahal in 1639 and extended the city further. At this point of time, Ganga begun to oscillate in the opposite direction, consequently the silt or sand getting deposited, it produced new Chars and Diaras along its right bank. This made the city vulnerable. When Mirjumla transferred the Headquarters of the Subah back to Dhaka in 1660, it appeared that the river had shifted more than 4 km away from the city. It left Rajmahal as a mediaeval relic city. This shows how the history of the rise and fall of the capital were affected along the shifting routes of the Ganga.

Two centuries later in 1776, Rennell (eminent English Geographer and Historian) visited the region where Gaur existed. He found the Ganga flowing more than 16 km to the city's west. In his Memoir of a map of Hindustan he wrote (1793) – ‘No part of the site of ancient Gaur is nearer to the present bank of the Ganges, than four miles and a half; and some parts of it which were originally washed by the river, are now 12 miles from it...’ In 1826 eventually Tandah (the later capital) got also swallowed by the river and its site later emerged as a DiaraChar<sup>3</sup>. Thus, Ganga went far more than the site where it used to flow earlier.

In the second half of the 18<sup>th</sup> century, the Ganga was bifurcated near Rajmahal, with a riverine island or 'char' called Bhutni. According to maps of Rennell(1764-1767) and those of the revenue survey (1847-1849), the Ganga then flowed flanking the north-eastern side of Bhutni<sup>4</sup> Furthermore, the shape of the channel changed considerably in accordance with the changing course of the Ganga. According to the revenue survey map of Malda(1847-1849), during later decades, the river again formed a mighty bend. It came back to its western path during the early 20<sup>th</sup> century.

Bankline surveys and survey maps since 1922-23 shows that the Ganga in its course past the Malda Diara, has often changed course in the section between Rajmahal and Farakka. These changing courses can be understood with reference to the site of Gaur, as has been mentioned earlier. The later maps and satellite imageries show evidence of pronounced leftward swing past Rajmahal and a swing to the right past Farakka. After passing the circular embankment that shields Bhutni, therefore the river rubbed to find a deep channel for itself along its left bank as it passes the Malda Diara, which caused huge left-bank erosion in Manikchak and Kaliachak 2 blocks<sup>5</sup>. The Diara stretching over the ancient floodplain comprises a sandbank-base, overlaid by colloidal silts. These are vulnerable to saturation. The river by increasing its flow, strikes the layer, the base is scrubbed, and causes bank failure.

Thus, all these records show that Ganga has been shifting its course from long time ago that has constantly shaped and reshaped the territorial history of the Malda district.

In the second decade of the 20<sup>th</sup> century, the course of the Ganges between Rajmahal and Farakka was straight and aligned in a south-easterly direction (described in the topographical sheet bearing no.72 p/13, 1:63360, surveyed in 1922-23). This is a changed course of the river, previously Ganges flowed along an altogether different course dashing Gaur as has been described by Radhakamal Mukherjee in his book.<sup>6</sup> This has also been expressed by Jadunath Sarkar (1973) who wrote that- the glories of Gauda under Hindu and Muslim rule, have been reduced to dusts and the ruins of their capital lied scattered in heaps for miles along the eastern bank of Kalindiriver, through which flowed the main current of the Ganges down to the close of the Thirteenth Century.<sup>7</sup> However, the course of Ganges being changed many times has challenged the living of the people terribly till 1962. After that Farakka Barrage arrived in the scenario, which further worsened the situation.

It is here important to mention that there are some geographical factors also, that lead to the erosion of Ganges, in the study area. When a river reaches its downstream segment, the slope gets flattened. Thus, the velocity of the water gets reduced largely. This increases lateral erosion and the river catchment widens itself. Consequently, the river while flowing through the catchment area, gets divided into many new streams. Thus new branches of the river are born. From Rajmahal to Farakka, it is the downstream portion of Ganges. Thus, in this segment the flattened slope and low velocity of water does not allow the river to carry the eroded materials (of earlier portions, particularly those of medium or high diameters) further. Moreover, in the post-Monsoon/Winter and pre-Monsoon/ Summer period, both the amount and velocity of water in the river decreases, which makes the river unable to carry the eroded materials of Monsoon. Thus the eroded materials get deposited in the riverbed, which is called the siltation process. In this way, islands are born. Some islands get washed out or sinked, some remain. In winter, the dead islands get raised again or new islands are born. Thus the siltation process is cyclic and continuous, giving birth to islands or chars. The river while striking the island gets bifurcated. A single flow-pass, thus gets divided into number of flow-passes. Through these many narrow waterways, the water gets additional flow velocity which exerts additional pressure on the riverbank. Thus the lateral pressure on the left bank is increased. Out of this additional pressure, the bank ultimately collapses.

Moreover, Ganga while flowing from Rajmahal to Farakka, its left bank is on Malda side i.e MaldaDiara. The eastern Bank of the Ganges falls in the Jharkhand side. The geological composition of Malda Diara side is such as it consists of sand, silt and clay. This sedimentary soil does not have good compactness between its materials. Thus the soil is very much vulnerable and gets eroded easily by the striking water. On the other hand, the soil of Jharkhand side is consisted of igneous rock of the plateau of Chotonagpur. As a result, it is very hard in nature. Thus, while facing the rage of the furious river, it stands much stronger. Thus, Malda Diara region situated on the left bank, in this way has been being eroded for years.

Behind the devastating consequences of Ganga erosion Farakka Barrage contributes a lot. This Barrage was constructed in 1971 with the aim of inducing water into Bhagirathi-Hoogly River, in order to flush the sediment load into the estuary. The objective was to increase the navigability of Calcutta Port and making it actively work. But it has made no success to achieve its aim, rather has caused huge change in the course of the Ganges and consequent erosions in the river-banks.

According to many river experts the construction of the Farakka Barrage has been accomplished by ignoring the river-science. Actually Farakka Barrage has created an obstruction in the path of the natural flow of the Ganges. Due to the Barrage, the normal balance of the flow or the dynamic equilibrium of the river was damaged. By the construction of the Barrage, an artificial base level was made to store the water. But it is understandable to the river that the base level is not natural. According to the normal tendency, a river would continue to flow until the ultimate base level or estuary is reached. Thus, river Ganga also did not accept this artificial base level created by the Barrage and tried to maintain its natural movement.

Ganges, which was flowing south eastward earlier, now faced the obstruction of the Barrage in the flow path. Therefore, the river could not move forward. In this situation, Thus, it has attempted to cross the length of the Barrage, in order to find a new way and flowed through the two sides or banks of the river. This has caused erosion and flood in the adjacent areas. As the soil of the right side is hard to erode, as mentioned earlier, the river finds it easier to erode the left bank and find a new path. It resulted in huge land loss in the Diara region of Malda.

Moreover, Hugli having a tidal estuary, has an uneven ratio of volume of water between north flowing tide and south flowing monsoon flow (160:1).<sup>8</sup> Thus, it was not at all possible for the induced water, to flush out the sediment load down to deeper estuary, competing the large volume of water of the tidal flow. Thus, the construction of the Barrage, or the calculation behind it did not go well with the output, rather it resulted in erosion in the river bank. According to the eminent River experts Dr. Kalyan Rudra and Chinmoy Ghosh - the change in the course of Ganges in 174 km of its length from Rajmahal Hills to Jalangi has been caused by the negative impact of the Farakka Barrage project. The 13th Legislative Assembly Committee (2004) in its 7th Report noted that- " It is accepted at all levels that the construction of Farakka Barrage is solely responsible behind the erosion of river Ganges in Malda district".<sup>9</sup>

Apart from this, the construction of Farakka Barrage has led to the sediment deposits in the riverbed. Thus, the course of the river started getting curved in order to store the water deposit in the upstream. As a result, the river tried to extend its length by cutting the bank so that it could store the surplus water, which also leads to erosion K Parua (2002), the Superintendent Engineer of Farakka Barrage project once opined that - "The construction of the Barrage has disturbed this apparent equilibrium condition and the river started to adjust this huge human interference by aggradation and degradation of its bed and channel pattern by erosion and siltation... This has increased the flood intensity on upstream at lesser discharging post- Barrage situation which could be noticed in Malda district during last two decades.

However, the tendency of eastward migration of the river was noticed long before the Farakka Barrage arrived in the scenario, but it cannot be denied that the situation furthermore declined after the Barrage's structural intervention with partial blockade of the river by the coffer dams, in early 1960s. The river formed then a mighty bend between Rajmahal and Farakka- the former is a geological node, and the latter one is artificial.<sup>10</sup> After the Barrage was constructed, 87 million m<sup>3</sup> of water was impounded above the Barrage. Caused by this, along with the boulders getting dislodged, the water level was raised by about 6.71 m. <sup>11</sup> The river, thus had no other option but to widen itself to adjust the additional stored water. The river then started encroaching eastward. In this process, Ganga eroded so many lands and homes of people. Dr. Kalyan Rudra (November, 2009) has shown, Ganga engulfed 64 mouzas, of the 267 km<sup>2</sup> area of Maldah<sup>12</sup>.



However, Ganges changes its course earlier than the Barrage, also, as has been mentioned in this writing earlier. The famous surveyor Buchanan Hamilton showed, in 1810, the general set of the river was away from the plains of Malda and Rajmahal was on the riverbank, while later in 1870, due to the eastward migration of the Ganges, Rajmahal, became deserted. Behind it, it was the river which after rounding the Rajmahal hills, came against the island char of Bhutni Diara, followed the eastern channel instead of the western, which resulted in considerable erosion on the Malda bank<sup>13</sup>. Thus erosion occurred earlier also, caused by the changing course of the Ganges. But it has also been argued that due to the Farakka Barrage Project, the course of the Ganges changed a lot more which ultimately resulted in much more severe erosion. The construction of the Farakka Barrage has brought a major change in the topography and hydrography of the study area. Below Rajmahal, the river is divided in two with Bhutni Diara. As the eastern channel has dried up due to siltation, the river started flowing through western channel. The Barrage has hindered the natural oscillation of the river within its meander belt. The water level of Ganga rose upstream of the Barrage and the ground water level experienced huge change in the district of Malda. It is found that since 1975, water levels in Ganges (on the basis of monthly hydrological alteration) was decreased drastically. The water level in January, 1956 was 17.556 m, which suddenly declined to 15.574 m from 1975 due to the construction of the Farakka Barrage. It started ecological disturbance certainly on and from 1976. After it was constructed and commissioned in 1975 on the Ganges, the flow reduced significantly from 1975-76.<sup>14</sup>

Even, the Barrage caused a huge decrease in the water flow of the Padma river. This resulted in a massive agitation in Bangladesh. After a long period of diplomatic and political debate or discussion between India and Bangladesh, a water distribution agreement was signed in 1996. Though no permanent solution has been met till now.

Thus it can be opined that both natural as well as man-made factors have caused the shifting course and consequent erosion of the Ganges, which further led to the suffering of people living in the affected or erosion-prone areas. The official records regarding the land erosion in Malda show- 14,335 hectares of fertile land was eroded from the left bank of the river 1931-1978 and the total eroded land during the period 1979-2004 was measured to be 4247 hectare. More than 200 sq.km. fertile land was swept away till 2004 and almost equal extent of char has emerged along the opposite bank.<sup>15</sup> Still, no solution was possible to make to check this problem of erosion of the river Ganges in Malda, caused by its shifting courses. It can, however, be also opined that the river would have been better left to its own rhythm, to flow naturally, in order to do away with these further devastating erosions.

## **Conclusion**

In this paper, an attempt has been made to trace in historical context, how the course of Ganga has shifted at various points of time. Apart from natural or geographical causes, there are manmade causes also which contributed even more to the changing course of the river and consequent erosion. In fact, various geographical researches have suggested that the construction of Farakka Barrage in 1975 has resulted in considerable hydrological changes in the lower Ganga river system, particularly in Malda district of West Bengal. This manmade factor has disturbed the normalcy of the river flow in this region. The water diversion upstream of Farakka in Malda district, and related hydrological alteration of flow was the outcome of the Barrage. This brought altogether a new ecological system against the usual course of nature. As a result of these, huge amount of lands were eroded in the affected areas. This affected the people living there hugely, they lost their homes also. They got no other option but to struggle to earn livelihood. The normalcy of their life was destroyed, in the lack of money, home, proper educational, even proper medical facilities. Most tragic part is that this has been being continued till now. Despite various attempts for the betterment of the situation of erosion and the condition of the erosion-victims, no change has been noticed. These helpless people, finding no end to their sufferings, just carry a vacuum in the eyes. In this pathetic condition, year after year, they continue to survive.

**Endnotes:**

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2. Ibid. p. 7.
3. Ibid. p.7.
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5. Ibid. p. 163.
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8. KalyanRudra, *The Shifting of the Ganga and Land Erosion in West Bengal A Socio-ecological Viewpoint*, p.18.
9. Ibid.p.24
10. Kalyan Rudra ,*The Encroaching Ganga and Social Conflicts: The Case of West Bengal, India*, pp. 10- 13.
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13. M. O Carter, *Final Report On the Survey And Settlement Operation In The District Of Malda 1928-35*, p. 8.
14. SamratMajumdar and Sujit Mandal ,*Impact of the Farakka Barrage on the Thresholds of the Hydrologic Flow Regime through RVA in the upstream of Ganga River near Malda District, West Bengal* , p.69.
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