



A critical review on gradual degradation of the River Anjana with fish resource due to inhuman activities

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Abstract

The River Anjana was voluminous healthy water body with its natural ecosystem. The resident of famous zamindar Raja Krishna Chandra Roy of Nadia district is situated on the bank the Anjana River. The Anjana River is a connection between river Jalangi and river Churni. Thus it maintains the water balance at the time of monsoon. The river was a good medium for water transportation mainly for trading. The water of the river was also used in irrigation. There was abundance of fishes. Thus the river had a great socio-economical as well as ecological significance. But the increased population and occupancy of the river bank transform this healthy river into a narrow, degraded canal. This is a review about the causes of destruction of the river Anjana with its biodiversity and will prevent further degradation.

Keywords: anjana, river, degradation, canal, human activity, common fish species

Introduction

Rivers is the one of the main attention of west Bengal to understand its environmental consequences as well as biodiversity. In Nadia district rivers and wetlands make the fluvial system in the lower part of Ganga basin. Nadia is the land of rivers like the River Bhagirathi, River Mathabhanga, the River Ichamati and the River Jalangi, the River Bhairab, the Churni. There is another river Anjana which is originated from river jalangi. This river had much important contribution in fishing as well as water transport in the Nadia district from ancient period to recent past. It used to carry abundant water from the river jalangi to river Churni, maintaining the main water connection. But along with the time the river is suffering from its decreased natural flow due to natural cause as well as human activity. After gradual degradation it became 'Anjana Khal' which is known to us as 'Anjana Nadi' from Rabindranath Tagore's famous poem line. Now it is a dead drainage system.

Objective

The primary objectives of this review is-

1. The main causes of its degradation
2. Physicochemical properties of Anjana
3. The recent common fish fauna of the river and the common bird species.
4. General awareness

Geographical Area

The source of the river is Jalangi River; Lat 23°25'11.46''N and Long 88°28'57.92''E. The source of the river remains invisible most of the time of year. From its source point the river first flows to the north and then cross the Bunglow of Nadia Police Super then it flows to the eastern side. Then the river passes through the Krishnagar Municipality and the villages such as Dogachhi, Khirpuli, Hatboalia, Jalalkahali, Dharmmadaha, Patuli, Ballabpur, Badkula, Gangni, Mugrail,

Gagakhali, Byaspur. On the way of its flow it became bifurcated. One flow goes to the eastern direction name Sonamukhi and the other flow goes to south as Anjana. After flowing 29 KM it meets to the River Churni; Lat 23°16'56.25''N, 88°35'01.51''E (Pritam, 2014).

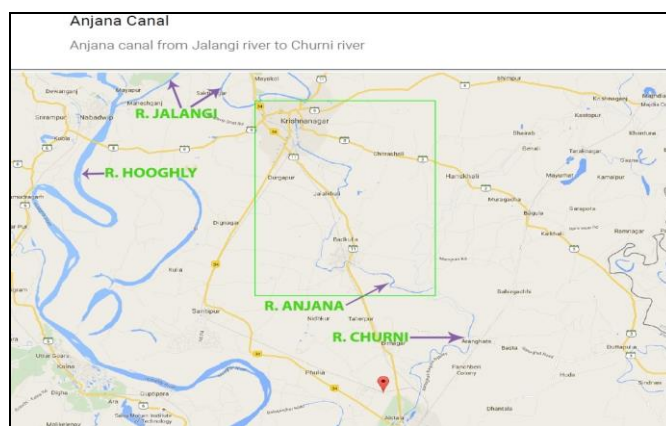


Fig 1: Map of River Anjana (Google map, 2015)

Physicochemical properties of Anjana

Anjana runs near about 8km through the populated municipal areas. So it is affected by the municipal effluents. A sample of its water collected in a winter day in recent years shows that: Temperature: 24° C, DO: 5.6, BOD: 4.8, P^H: 7.81, Phosphate: 0.29, Nitrate: 0.007, Free CO₂: 1ppm

Causes of degradation of river Anjana

1. **Loss of water in The River Ganges:** The source of the Anjana is Jalangi River which is originated from Padma River. As the water of the source river of jalangi is decreasing. So the jalangi is not getting adequate water causing decrease in water quantity of the river Anjana (Rudra, Kalyan 2008)

2. **Tilt of Bengal Basin:** The Bengal basin is tilting towards eastern side from 17th century. Due to this tilting river Bhagirathi has been converted into a degraded river. This is one of the main causes of degradation of Anjana.
3. **Sedimentary deposition in origin:** Deposition is a normal function of river. But the problem is that the alluvial deposition of Jalangi has taken place at the source point of river Anjana. According to study Anjana's river bed is nearly 1M high from the Jalangi's river bed.
4. **Effect of Farakka barrage:** for saving the Calcutta port from siltation and low water Farakka barrage was made. But due to sedimentation problem the source of the River Bhagirathi became narrow. As a result mainly in summer season very low amount of water passes through the river. So due to low amount of water in the main river simultaneously Jalangi and Anjana is suffering from low water.
5. **Manmade barriers:** Raja Rudra Roy made a bandh at the source point of Anjana to resist the 'Jaban army' but it causes the stoppage of water flow and transportation via Anjana River. Even today a soil dam is found at source which prevents the water flow from Jalangi to Anjana. A long dam was made through the left bank of River Jalangi to prevent the flood. (Figure:2)



Fig 2: manmade barricade of soil

6. **Effect of urbanization and Encroachment:** there is rapid increase of population the district of nadia in the contemporary time. So a large number of people are buying low land illegally at the bank of Anjana at a cheaper price. A large no of people occupying the bank by depositing soil and other garbages destroying the natural flow of the river as well as its ecosystem. Mainly peoples are making building and concrete constructions altering the river into a drain of the Krishnagar Municipality. But once this river was the main water transport system of the famous King of Krishnagar. But the river had its own natural flow in up to nineteenth century (Sanjit Dutta 1996). Now in the urban area, most of the bank of the river is occupied by human activities. Not only in the urban area, the bank of the river occupied in the village area for making home, agricultural land, brick industry etc. (figure:3 & figure:4)



Fig 3: Concrete constructions on bank of river



Fig 4: Brick industry on the bank of the river

7. **Wastes from different sources:** Wastes from different sources is another cause of destruction of the river. Many households such as parts of vegetables, wrappers, waste products, latrine of human being and animals are thrown into the river making it a backyard dustbin. Various liquid wastes and other wastes from home, different gov. organization, hospitals etc. are thrown into the River Anjana (figure: 5 & figure:6).



Fig 5: garbage on bank of river



Fig 6: Municipal waste water



Fig 8: Manmade unscientific culvert

8. **Fishing pond:** Pisciculture was started by Fisherman co-operative Society in 1945 in Anjan River. Then it was held by govt. and non govt. organization. But later due to private activities the river was divided into several parts for pisciculture. Some portion of the river is bounded to prevent fish's movement. So now Anjana River became a stagnant 'khal' simultaneously 'ghosh pukur', 'Rajdighi', 'Manasapukur' etc. (figure :7).



Fig 7: Manmade unscientific fishing pond

10. **Hyacinth and weed:** There are many areas seen in the valley of the Anjana which is filled with water-hyacinth and weeds except fishing zone. This is one of major cause of destruction of river Anjana (figure:9)



Fig 9: Occupancy of river bed by man & weed

9. **Making of culverts and bridges:** There are several bridges and culverts over the river Anjana mainly in Krishnagar town. In most of the cases the culverts are too narrow; sometimes just 2-3 feet destroying the natural flow of the river (figure: 8).

Recent common fish species of the River Anjana

There were several natural fish fauna in this river. But now some fishes are extinct from this river and some are endangered. The recent fish species, used as local source of fish protein are described in the table no. 1 (I.S. Gangopadhyay 2016, Dogachhi Society 2016).

Table 1

Sl.no.	Scientific name	Common ame/ local name	Family
1	<i>Catla catla</i> (Hamilton)	Catla	Cyprinidae
2	<i>Labeo rohita</i> (Hamilton)	Rui	Cyprinidae
3	<i>Cirrhinus mrigala</i> (Hamilton)	Mrigel	Cyprinidae
4	<i>Amblypharyngodon mola</i> (Hamilton)	Mourala	Cyprinidae
5	<i>Ctenopharyngodon idella</i>	Grass carp	Cyprinidae
6	<i>Hypophthalmichthys molitrix</i> (Valenciennes in Cuvier and Valenciennes)	Silver carp	Cyprinidae
7	<i>Labeo bata</i> (Hamilton)	Bata	Cyprinidae
8	<i>Puntius ticto</i> (Hamilton-Buchanan)	Tit punti	Cyprinidae
9	<i>Puntious stigma</i> (Hamilton)	Punti	Cyprinidae
10	<i>Mystus tengara</i> (Hamilton)	Tangra	Cyprinidae
11	<i>Wallago attu</i> (Schneider)	Boal	Schilberidae
12	<i>Notopterus chitala</i> (Pallas)	Chital	Notopteridae

13	<i>Notopterus notopterus</i> (Pallas)	Foli	Notopteridae
14	<i>Channa punctatus</i> (Bloch)	Lata	Channidae
15	<i>Chana striata</i> (Bloch)	Shol	Channidae
16	<i>Clisa fasciatus</i> (Bloch & Schneider)	Kholisha	Channidae
17	<i>Gadusia chapra</i> (Hamilton)	khoira	Clupeidae
18	<i>Oreochromis mossambica</i>	Tilapia	Cichlidae
19	<i>Heteropneustes fossilis</i> (Bloch)	Singi	Heteropneutidae
20	<i>Monopterusuchia</i> (Hamilton-Buchanan)c	Kuche	Synbranchidae
21	<i>Anabas testudineus</i> (Bloch)	Koi	Anbantidae

The common Bird species of the river basin

There are many birds found in the surroundings of the River Anjana. Among them some are residential and some are

migratory in nature. The common birds, depend on the river are showed in the table no. 2 (I.S. Gangopadhyay 2016, Dogachhi Society 2016).

Table 2

Sl.no.	Scientific name	Common name/ local name	Family
1	<i>Egretta intermedia</i>	Intermediateerget/ majhari bak	Ardeidae
2	<i>Egretta gargetta</i>	Little egret/ choto bak	Ardeidae
3	<i>Phalacrocorax carbo</i>	Great cormorants/ Baro pankouri	Phalacrocoracidae
4	<i>Phalacrocorax fuscicollis</i>	Indian comorants/ Majhari pankouri	Phalacrocoracidae
5	<i>Microcarbo niger</i>	Little comorants/ Choto pankouri	Phalacrocoracidae
6	<i>Alcedo hercules</i>	Blyth's kingfisher/ Choto machhranga	Alcedinidae
7	<i>Alcedo atthis</i>	Common kingfisher/ Neel machhranga	Alcedinidae
8	<i>Anas acuta</i>	Northern pintail/ Dighi hansh	Anatidae
9	<i>Nettapus coromandelianus</i>	Cotton pygmi goose/ Bali hansh	Anatidae

General awareness and steps for conservation

Anjana River is a small river but it is full of biodiversity. It helps a large area of Nadia district including district town by supplying edible fishes. There are many pisciculture zones in the River Anjana (figure: 10-13). So the river has a great socio-economic importance. But the polluted water with nitrate and phosphates from domestic sewage and occupancy of river bank by garbage increases the nutrient load in the water body. The nutrient increases the productivity of water resulting in the eutrophication and algal bloom leading to diverse ecological changes within the system. Algal bloom causes depletion of oxygen in water body which causes serious problem to fishes and other living organism. So there should be following activities to protect the river from its death along with its biodiversity.

1. The Anjana River became narrower mainly in the urban areas. Many people are living illegally on the bank of the river. So the municipality of Krishnagar and Panchyat of other villages should take step against them and passing of building plan on the river bank should be banned.
2. Another main problem is throwing of garbage on the river bank. So, every people should be aware of this. There should be frequent and regular garbage collection by the Municipality with proper monitoring (figure: 14).
3. There were many clubs of the local people. If the clubs take step for general awareness for the conservation of the river it will be fruitful.
4. Anjana River has not only natural importance but also socio economic impotence. Anjana River helps in the drainage of waste water. But it is also a great supplier of fish for neighbouring areas. So the waste water may contaminate the fish resource as the river's natural flow is

Decreasing day by day. In some places the river is so narrow and polluted that no fish can live there. This polluted water body smells badly. It is also a breeding ground of mosquito.

5. As Anjana becomes a closed channel so there is a heavy chance of flood. In the year 2000 a devastating flood occurred and the overflowed narrow Anjana destroyed most of the human structure of its bank.
6. River always an important ecosystem itself. But the most of the river ecosystem are suffering human activities. Anjana River is also a victim. There was natural flow with a normal ecosystem upto seventeenth century of the river. But after the King Rudra Roy the flow of the river started to decrease (khitish Banshacharit).



Fig 10: Fishing in the River Anjana



Fig 11: Fishing in the River Anjana



Fig 12: Fishes of The River Anjana



Fig 13: Transport of fishes to local markets



Fig 14: Hording for awareness from Krishnagar Municipality

Conclusion

Once upon a time the River Anjana was a healthy river with its natural ecosystem. But now it is a degraded canal. The Anjana River was first dredged after freedom of India in the year 1951 under the observation of Manindranath Mukhopadhyay, The Honorable Magistrate. After many years in 1985 another project for reclamation of River Anjana was taken on behalf of local MLA (Dutta Sanjit, 1996). Nadia Zila parishad took small activities for the reformation of the river in the year 2006. In 2008 again a project for revival of Anjana River was taken under the supervision of local MLA Mr. Subinay Ghosh. But the effort turns into vain. In the year 2013 again distict administration took a project for reclamation and rejuvenation of river Anjana under MGNREGA, '100 diner kaaj' (ABP, 2015). But it is still going on without any progress. Above discussion shows there is no fruitful activity for the development of degraded Anjana River. So if nobody take steps against its further degradation the will be an oblivion. Many people economically depend on this river. The River Anjana contains a healthy ecosystem with a natural biodiversity till now. But if the river dies there will be a huge loss of biodiversity as well as scocio-economic crisis. So there should be no more concrete construction on the bank of the river. Local people need a general awareness. Prevention of garbage throwing in the river is too necessary. Regular observation, dredging, aquatic weed, control widening of the narrow river, pollution control should be performed under the govt. project and also under the local bodies throughout the year. Otherwise this inhuman attitude will be responsible for the destruction of The River Anjana.

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