



## A Voluminous River of Yesterday- A Degraded Canal of Today: Physical and Human Aspects

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### ABSTRACT

Anjana, once the main left side stream line figure of river Jalangi, has now become a narrow canal. As per records of Nadia district, the then voluminous river Anjana was the only short cut to go from one side of the district to other, and also it maintained the water balance between river Jalangi and river Churni at the time of Monsoon. Thus this river had immense socio-economic as well as hydro-geological significance. The residential area of the then Zamindar Raja Krishna Chandra Roy was also located by the banks of river Anjana. Navigability of the river aided in mercantile trade to and fro Nadia district during the time of Raja Krishna Chandra Roy. Settlement developed by the banks of this river due to its navigability for trade and transportation purpose; moreover, ample water supply for irrigation was an added advantage. Gradually, due to population pressure owing to increasing human occupancy of the area, the whole river system changed. It turned to a degraded, narrow, congested canal as seen in the contemporary time owing to various socio-economic and anthropogenic factors. Hence, there has been a sea change in the whole river system of anjana from a voluminous river to a degraded 'Khal'. This paper is an attempt to summarize what physical and human aspects have deteriorated this voluminous river into a degraded canal gradually and are presently continuing to do so, and how the negative effects on the river bed has been detrimental to the immediate surroundings.

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### 1. Introduction

Degraded river Anjana, the main left side stream line figure of the river Jalangi, had many important contributions from the ancient period to the recent past to the riparian system of the district of Nadia. Through the glorious history of Bengal's trade it had a many contributions to the society, especially on the

merchant life and on the water transport. In addition, the river also contributed in fishing and in recreation for the Zamindars' daily lives. It used to carry abundant water from the Jalangi to the Churni, thus maintaining the water balance between these two rivers. Hence, the disruption of the hydrological balance was prevented. However, along with time the natural flow of the river Anjana altered its path due to natural as

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well as anthropogenic factors; it led the river to a dead drainage system – a "khal" or a canal, of the Bengal basin. Tracing out the factors and their impacts are the prime concerns of the study.

## 2. Geographical setup

The total flow of the river from its source to the mouth is nearly 29km, with coverage of 8.2 km within the municipal boundary of Krishnagar. Lat 23°25'11.46"N and Long 88°28'57.92"E is the source of river Anjana. From its source point at the Jalangi, Anjana flows to the north and then takes a left turn after crossing of the Bungalow of the Superintendent of Police of Nadia district and then it flows to the eastern side. On the way it passes through Krishnagar, once the Capital City of the district. In the Cadastral map no. 115 it is found that the Ancient River Anjana passes through

the villages namely Hazaripota, Katchuidanga, Nityanandapur, Baghajatinpally, Haripurpara, Jalalkhali, Badkulla and others. On the way of her flow this stream line has been bifurcated at the location of 23°22'04.89"N, 88°31'51.005"E. One flow to the eastern direction as Sonamukhi and other as Anjana, flowing to the south. Both the branches again meet at river Churni (at 23°16'56.25"N, 88°35'01.51"E) which is also a branch of Padma (Branch of river Ganga-main flow) flowing from eastern to the western direction and meet river Hugli at Payradanga. (Source-Google earth). By seeing this physical aspect of the river matrix it is easily understood that once the river Anjana directly controls the water balance between two major river systems of Nadia district, in its source and at its mouth.

Table 1 : Water parameters in different decadal period in river Ganga

Time (Days)	Average Water 1948-73 (In Cusec)	Average Water 1949-88 (In Cusec)	Average Water 1973-88 (In Cusec)	Average Water 1989-97 (In Cusec)	Average Water 1997 (In Cusec)
<b>January</b>					
1-10	131333	107516	23817	14290	93226
11-20	119667	97673	21994	13196	84477
21-31	110000	90158	19846	11908	78246
<b>February</b>					
1-10	105667	86323	19344	11606	74717
11-20	98667	82859	15808	9485	73374
21-28/29	93333	79106	14227	8536	70570
<b>March</b>					
1-10	87000	74419	12581	7549	6680
11-20	84667	68931	15736	9442	59489
21-31	81333	58688	26645	15947	38741
<b>April</b>					
1-10	78667	63180	15487	9292	53888
11-20	74000	62633	11367	6820	55813
21-30	73333	60992	12341	7405	53587
<b>May</b>					
1-10	75333	67351	7982	4789	62562
11-20	79000	73590	5410	3246	70304
21-31	87333	81858	5479	3287	78567

(Source: Banglar Nadi Katha, Kalyan Rudra)

### 3. Degraded of Anjana river

Like many other rivers of the world, the water of the Anjana Khal is also decreasing and deteriorating. It is happening due to many natural and man-made factors. In most of the cases the main cause of Anjana's degradation is lack of people's awareness in judicious use of the river water. The degradation of Anjana River began a long time ago, in the 17<sup>th</sup> century. The geological tilt of the Bengal basin towards the east is also the major influencing factor for the degradation of many other rivers in the basin.

#### 3.1 The Physical Factors

##### 3.1.1 Loss of water in Ganga River

The source of Anjana is Jalangi and the source of Jalangi is Bhagirathi. And Bhagirathi is one of the main tributaries of Ganga. As the water of Ganga has been decreasing, Jalangi is not getting its adequate water. As a result the Anjana khal is not also getting its adequate water. In the recent time the main source of water of Anjana is water of rain. Table 1 shows the degradation of the volume of water in River Ganga over a certain period of time:

##### 3.1.2 Alluvial depositions in source point

One of the normal and natural functioning of a river is deposition. Jalangi's alluvial deposition has taken place at the source of the Anjana. As the mean sea level height of Jalangi's deposition has surpassed the valley's mean sea level height, the source of flow of the water of the river Anjana has been stopped naturally.

Study shows that at the source point, Anjana's river bed is nearly 1 metre high from that of the river bed of Jalangi.

##### 3.1.3 Tilt of the Bengal Basin

According to Kalyan Rudra's (Eminent river researcher) research work, it is seen that the Bengal basin has been tilting towards the eastern side 17<sup>th</sup> century onwards. Hence, the main river of Bengal, the Ganga's main flow through the Bhagirathi has been changed and duly shifted through the river Padma, to the east ward direction. Due to this effect of tilt every tributary of Bhagirathi has been converted into a degraded river from an active one. Anjana River had been no exception to this.

##### 3.1.4 Impact of Farakka Barrage

For the prevention of Calcutta port (from wilting and siltation), the Farakka Barrage was constructed, for uninterrupted water supply throughout the year, maintaining the average water level of the port which is 6 m. But after the initiation of the barrage some other problems cropped up. Siltation made the

Bhagirathi's thalweg very narrow. Hence, in the summer season a very little amount of water passes through the course; as a result the tributary, Bhagirathi has been turned to a degraded river due to flow of lesser amount of water. The source of river Anjana is River Jalangi which is the major tributary of Bhagirathi; it has also been affected due to its lesser amount of water. As a consequence the river Anjana has been converted into a degraded river.

#### 3.2 The Human factors

##### 3.2.1 Barriers and barricades

Numerous literatures reveal that during the reign of Raja Rudra Roy there was a dispute regarding the humiliations of "jaban", and then he stopped the water transportation via Anjana River. As a result the source of Anjana was barricaded. Even today it is found that a nearly 65m long soil dam exists which prevents the river Anjana from getting water from the source of river Jalangi. A few years back the left bank of River Jalangi was bounded for the prevention of flood. The source Point of Anjana River is situated in the same side. As a result a long barrage has been created at the source of the river Anjana. [Note: The height of the sluice gate which was founded in that barrage across the valley of Anjana was so high, that the water transfer between the river of Jalangi and Anjana could not take place.]

##### 3.2.2 Encroachment

At the contemporary time, with the rapid rise of population, a large proportion of people are buying low land at the bank of Anjana at a cheaper price. Following it, the residents dwelling by the banks of the river are heightening the land by depositing soil and binding the river side of Anjana to keep themselves and their houses free from danger of flood. Not only some of the houses are constructed over the valley of Anjana, thus disrupting its flow, but also some shops are constructed over the valley with help of beam and cement and concrete. This is devastating for the valley floor as well as the water flow. Most of the buildings which are constructed, occupying the banks of Anjana are at Christian Para, Nader Para, and Chaudhuri Para. Though the condition of Anjana River is in a little bit of better condition in the Wards No. 24, 10, and 11 in the Krishnagar Municipal area, in rest of the places, due to the encroachment of the people besides the river, the river has gradually been narrowed. In the book of Sanjit Dutta "Anjana Nadi Tire" it has been shown, during the medieval period and the begin of the colonial period, the river Anjana had flown with the enormous water that was being drained from the Jalangi. At the time of monsoon



Fig. 1 civilization on river bed



Fig. 2 Deposition of waste materials

when the Jalangi was over flooded, flowing of water to Anjana was the only outlet to control the overflow of water from Jalangi to Churni. This widened the river valley of Anjana. But presently, human encroachment has made the river narrower, leading to only a hair line like narrow drain: a "khal". Some parts of the "khal" are just 2m wide, choked with weed, dumped with domestic wastes and pollutant water.

### 3.2.3 Wastes from different sources:

#### 3.2.3.1 Solid wastes

Different types of wastes from households (unnecessary parts of vegetables, waste products, latrine of human beings and animals) and all other types of waste products are thrown in the water of Anjana. It is a fact that now a days Anjana has become a backyard dustbin of every household situated by the banks of Anjana in Krishnagar municipal area.

#### 3.2.3.2 Liquid wastes

Water of drains from homes, water of drains from hospitals and other govt. Organizations located by the banks are thrown directly into the water of Anjana. The valley of Anjana in Krishnagar has become a drain of waste products.

#### 3.2.3.3 Source of garbage

Garbage from different sources is thrown into the river Anjana. Among them garbage from home is most important. Different types of garbage from shops and hospitals and other offices are also thrown into the river Anjana.

#### 3.2.3.4 Responsibility of fishing pond

Pisciculture had been arranged by Fisherman Co-

operative Society in the River Anjana in 1945. Then it was held by Govt. and Non Govt. Organisations. Later, it became a private individual affair without any proper control. As a result Anjana was divided into many parts for pisciculture. For this pisciculture some portion of water of Anjana is clean; however this cleaner water is being distracted from the main stream of Anjana.

As a result Anjana's valley has become more or less, a pond. Instances are 'Ghosh pukur', 'Manasa pukur', 'Rajmata dighi' and others. Some portions of the Anjana are bounded to prevent the movement of fishes elsewhere; but due to this the water is becoming stagnant and the pollution is increasing.

#### 3.2.3.5. Culverts and bridges

Being the district head quarter, Krishnagar has a wide transport network. Many bridges are made over the river Anjana and many culverts are constructed over Anjana for movement of the passersby. The diameters of the culverts are not more than 3 feet. At many places the mouths of the culverts are bounded. (The mouth of the culvert is bounded with net so that the fishes cannot go outside). Twenty five culverts have been found above the river Anjana in Krishnagar municipal area.

**3.2.3.6. Bounded water-hyacinth and weed:** The thing which is frequently seen in the valley of Anjana is water-hyacinth. All the area is filled with water-hyacinth and weeds except the place where fish is cultivated. The flow of the water is choked and the water gets polluted due to water hyacinth.



Fig. 3 Anjana used pisciculture



### **3.2.4. Responsibility of municipality**

#### **3.2.4.1 Illegal encroachment of land**

At the river side of Anjana, there are many houses that have no valid and legal documents. Many families are living there illegally. They had occupied land illegally from some corrupt people of the municipality.

#### **3.2.4.2 House plan**

Many houses at the riverside of Anjana have been constructed in an unplanned manner. In some cases the plans were passed after the constructions were completed. Due to lack of planning, most of the houses by the river banks are at a distance of not more than a foot.

#### **3.2.4.3 Frequency of garbage collection**

The garbage collection van of the municipality cannot enter the inaccessible areas of the river. The van comes once a week to collect the garbage. Due to lack of frequency of garbage collection, the local residents throw the garbage in the river. Above all, the municipality do not take any steps to solve their problem. So the depth of the river is diminishing.

#### **3.2.5 Role of clubs**

The famous Jagadhatri Puja of Krishnagar is observed by many clubs. Functions are also held at this occasion.

The unnecessary parts and other waste products which are generated from the Puja/ functions are thrown into river Anjana. As a result, the water of Anjana is choked and polluted. The clubs do not take any steps to reclaim the river or purify the water.

#### **3.2.6 Mass awareness**

The residents of Krishnagar municipality and their lifestyles are responsible for the pollution of the Anjana. The river has been recklessly and unmindfully considered by the people as a mere dumping drain. They just want to get back Anjana as a clear canal and nothing more than that. So, the river Anjana is facing a hapless condition of degradation by and by. Many important Govt. institutions have been built beside the river Anjana. The employees of these institutions keep on disposing garbage and unwanted things (food, snacks and drinks leftovers) in the river. Thus, the river is polluted and due to unnecessary waste materials being dumped in it, it eventually has been transferred from a river to a "khal", and used in the municipality as a big sewerage system, containing the domestic pollutant materials and polluted water.



Fig. 4 Breeding ground of flora and fauna

#### 4. Effects of Anjana's degradation

##### 4.1 Degradation of Water Ecosystem

Due to the pollution of water of Anjana the flora and fauna of the river are dwindling. Hence, the ecosystem of water is degrading and utterly polluted.

##### 4.1.1 Soil pollution

The soil is being polluted due to throwing of various waste products and polluted water into the river. So different organisms of the soil are becoming extinct.

##### 4.1.2 Bad smells

Different types of waste products of the households and hospitals are thrown into the river. As a result, an offensive smell is found in most of the areas. This creates nuisance for local people and passerby.

##### 4.1.3 Mosquitoes and others insects

As dirty water is the source of mosquitoes and other insects, the water of Anjana has become a breeding ground of the same. This leads to various diseases and health problems among the local residents.

##### 4.1.4 Flood

Anjana has become a closed channel. During torrential rainfall, the river banks are flooded. Hence, the local people face various problems. Flood of the year 2000 is a burning example. According to the local residents, the choked water of the Anjana had been the major reason of overflow of water due to high rainfall, which led to the devastating flood in that year. This led to immense loss of lives and properties in Krishnagar Municipal area.

#### 5. Conclusion and recommendations

The discussion above has been an attempt to throw light on the physical as well as the human factors responsible for the transformation of the then river Anjana to a "khal" of today. The degradation of the voluminous river into a wretched canal has cast a very significant impact on the daily lives of the people of the municipality as well as the passerby.

Tracing back to its past glory, it is seen that through a long period the gradual effects of physical factors as well as human interventions have played a crucial role.

The physical factors have led to high level of siltation which has denied the river of its natural navigability. The natural tilt of the Bengal basin has also disturbed the natural flow and direction of the river. Farakka Barrage construction, to save the Calcutta Port, had had its negative effects leading to siltation of the Bhagirathi; consequently, Jalangi and Anjana has suffered.

The human factors are manifold and more crucial. Utter indifference of the local residents as well as the

passerby towards the river has turned it to a polluted dumping ground. Lack of awareness to reclaim the river from deposition of water hyacinth, weeds, garbage and others by local people as well as govt. Organizations has added to the dismal scenario or the river.

The effects are equally devastating leading to the degradation of the river ecosystem, soil pollution, nuisance due to bad smell coming from the pollutants dumped into the river from households, clubs and offices, diseases caused due to mosquitoes and other insects and problems related to inundation.

Thus a very difficult, dismal and sorry picture of the Anjana has been traced out from its glorious period of past history to its present unhappy state.

Anjana's degradation is not a very recent affair. According to certain past records, the river began to degrade since the 17<sup>th</sup> century. In 1883 Rs. 15000/- were collected from the local residents of Krishnagar for reclaiming the river (Municipality Record Book, 1864-1964). But it had not been very effective. The river went on degrading. Later some other measures were also taken to renovate the river; for instance, in 1985 another project for reclamation of Anjana River was taken on behalf of the local M.L.A. (Dutta Sanjit, p.55). That effort too turned to vain. Very recently, in 2010, again a project for revival of Anjana River was taken with great care under the supervision of the M.L.A. with very positive impacts; the lion's share of the river is yet to be revived. Hence, it is seen that the above discussion has taken out a very critical picture of the river Anjana. It is the cry of the hour that the river needs to be reclaimed and rejuvenated to prevent it from further degradation and finally its getting lost into oblivion. Mitigation measures from the very grass root level are needed to be adopted and implemented by the individuals, clubs, offices and other institutions of the municipality to save the river. Certain way outs are cited below:

The river has lost its width; due to anthropogenic construction and activities the river valley has been encroached; hence it is not possible to retrieve its width. However, to reclaim it, redigging (to regain back its depth) of the total river is required with special emphasis to its stretch flowing within the municipality. The source of the river has been detached from the Jalangi. It is needed to rejoin the river with Jalangi at its source to revive the drainage of water to it. This would, in turn, regain the hydrological balance of the rivers. Further, this would help to retrieve the navigability of the river and it might be used as a medium of water transport which is pollution free

and very cost effective. The culverts over the rivers are required to be widened and lower parts of the culverts need to be cleaned by the local authorities to revive the flow of the river. The weeds and water hyacinth are needed to be cleaned at regular intervals to maintain the natural flow of the river. The fishery ponds of Anjana River are needed to be cleaned and nourished so that fish production is flourished; but unlike before, they should not be fragmented so that the natural flow of water is maintained. Moreover sufficient care should be taken so that polluted water can be not mixed in the productive zones of fishery. This will help to fulfil the local demand of people as well as supply of money to the fishermen. Activities are required to be undertaken to revive the gene pool of the river and thus maintain the ecological balance. Hospital wastes are also dumped into the Anjana. Proper hospital management techniques are required to prohibit this undue dumping of the wastes into the river. Garbage collection vans should come to all the localities within the municipality more frequently and on a regular basis; this would prevent the people from throwing the garbage into the river. The river has been turned to a dumping drain; proper vigilance from all fronts are required to check reckless throwing of garbage in the river; for this mass awareness at all the levels from individuals to clubs to shop keepers to Govt. And Non Govt. Organizations are required. The municipality should take strict measures to prohibit dumping of wastes in the river. For this strict laws are needed to be made and implemented. Regular supervision from the municipal authority of the implementation of the laws is required. Moreover, anyone breaking the laws should be strictly penalized to prevent any further littering of the river. A separate committee should be constructed with the help of

local people for rigorous monitoring of the Anjana River to maintain its cleanliness. The river sides should be reclaimed to regain its aesthetic beauty. Moreover, People's awareness should be increased through public demonstrations, workshops and seminars to increase the mass awareness about the present fatal condition of the river and to find proper way outs to save the river from losing into oblivion. Local people should be made cognizant about the destruction already done to the river due to their inhuman attitude and the immediate necessity not to repeat the same mistakes committed before.

### References

- Biswas Sujit Kumar, (2002). *Badkulla Parichay*, Sahitya Samsad, Badkulla, Nadia.
- District Census Handbook: Nadia District Census of India, 1961.
- District Census Handbook: Nadia District Census of India, 1971.
- District Census Handbook: Nadia District Census of India, 1981.
- District Census Handbook: Nadia District Census of India, 1991.
- District Census Handbook: Nadia District Census of India, 2001.
- Dutta, Sanjit (1996). *Anjana Nadi Tirey*, Dogachi Gram Panchayat,
- Dutta, Sanjit: *Phulodore Bandha Nadia o Rabindranath*, APS Multimedia, Krishnagar, Nadia.  
<https://earth.google.com>
- Krishnagar municipality Record Book, 1864-1964.
- Majumdar, Dr. R.C. (1971), *History of Ancient Bengal*, p. 4
- Roy, Niharranjan, *Bangalir Itihas, Adi Parba*, (Bengali), 1972.
- Rudra, Kalyan, (2008). *Banglar Nadikatha*, Sahitya Samsad, 32A, APC Road, Kol-700009.
- West Bengal District Gazetteers, Nadia District, 1978.