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**CANALS AND ITS RELEVANCE TO THE KOLKATA MEGA
CITY**

Dr. Chandani Bhattacharjee

Assistant Professor, H.R. College of Commerce and Economics,
Mumbai, India

Email: bhattacharjee.chandani@gmail.com

ABSTRACT

The city of Calcutta (Kolkata) has evolved over 300 years. It has been through a glorious past which can be attributed to various reasons, one of which is the presence of an extensive canal network. This enabled trading in the early 19th century and Kolkata became an important trading port. Archival evidences suggest trade between the Bengal basin and the Brahmaputra-Surma Valley. Commodities as varied as rice to pottery were shipped using the canal and the lower Gangetic basin. The canal network is largely a natural system owing to their location in the lower Gangetic Basin where the deltaic features are predominant. They have been excavated or dredged in sections to make them more sustainable. The role of the canals have been changing over the years, from navigation they have been reduced to become carriers of sewage and storm waters of the city. There are three major canals or khals in and around the city, Circular Canal, Tolly's Nala and The Bagjola and numerous tributary and distributary branches such as the Kestopur Khal, Beliaghata Khal and New Cut Canal among others. This paper highlights the profile of the canals and the manner in which the Kolkata city has grown spatially and demographically. It outlines the manner of the growth of the megacity of Kolkata along these canals.

Keywords: Canals; Megacity; Spatial Spread; Tolly's Nala; Circular Canal

INTRODUCTION

Popular stories and fables have given the city of Calcutta its present nomenclature, Kolkata thereafter officially renamed in 2001. Job Charnok, in 1690, is believed to have consolidated the three villages of Sutarnuti, Kalikata and Govindopur into the present day city. Like every urban agglomeration in a developing country the city of Calcutta grew from modest city to a megacity. Presently with an area of 185 sq.kms, Kolkata city, has a population of 4,496,694, in 2011(Census, 2011) which has fallen marginally from 4,572,876 a negative growth rate of -1.67%. The density is 24,306 persons per square kilometers. However, the Kolkata Megacity as per the Census 2011, the area has increased to include the urban townships around it as well such as Howrah, Maheshtalla, Rajpur Dumdum, etc. The population 2011 is 14,112,536 and extends over 1851.41 sq. km. and envelopes 3 Municipal Corporations, 38 Municipalities and 24 Panchayat Samitis(KMDA,2006) 1(Source: Kolkata Metropolitan Area (KMA) is the largest urban agglomeration in eastern India. KMA, as delineated under West Bengal Town and Country (Planning & Development) Act, 1979).

The entire layout of the canal system has a specific advantage for Calcutta. Initially the city stretched between the Circular Canal in the north to the Tolly's Nala in the south. With the expansion of the city aerially and demographically the extents have also been magnified to include the remaining canals of the city like Bagjola canal and Eastern Canals.

Profile of the Canals in Kolkata

The canal system has been a multipurpose waterway system in the Lower Gangetic Basin. It has played a major role for the movement of agricultural products, supplied waters for irrigation and provided vital nutrients to the *bheries* ² in the eastern part of the city. It has also played a role as the carriers of the city's refuse into the Bidhyadhari- Kulti River System. Its multifaceted use has helped the city to grow at its expense. It has led to the gradual development of the urban environment of Calcutta, replete with the slums, which occupy its banks.

The following canals that are found around the city:-

- a) Bagjola Canal
- b) Circular Canal –
 - i) Beliaghata Canal
 - ii) New Cut Canal
 - iii) Lake Channel
- c) Tolly's Nala - Kaorapukur Khal
- d) Eastern Canals- i) Inner Boat Route
ii) Outer Boat Route
- e) The Municipal Drainage Channel –
- f) i) Dry Weather Flow
ii) Storm Water Channel.

a. Bagjola Canal: This canal originates in the swamps of Ariadaha, Dakshineswar, it continues as a narrow ditch till it reaches south DumDum. A number of outfalls have contributed towards its increased flow of water. It has been cemented in sections till it finally meets the VIP Road near Krishnapur. Beyond the VIP Road, the Bagjola moves into the Rajarhat area, outside the urban limit. It plays significant role in irrigating the areas in the adjoining agricultural lands in the eastern marshes. It eventually meets the Kulti -Bidhyadhari river system.

b. Circular Canal: The Circular Canal or the Maratha Ditch as it was earlier called, begins at the River Hugli, near Baghbazar. Originally this channel was a shallow channel which became partly dry around 1800. Thereafter, widening and construction of the lock gate by the authorities were made in 1810 on the Hugli. (Bandopadhyay, 1990). The canal becomes bifurcated near into two branches, the Krishnapur Canal and the Beliaghata Canal. The Krishnapur Canal or the Kestopur Khal moves north east and runs parallel to Salt Lake. It encircles the Salt Lake City and joins the river Kulti at Ghusinghata. The Beliaghata Canal flows along the Canal East and Canal West Road.

The Lake Channel, was the natural drainage channel of the city. It was a spill *khal* (channel) of the Bidhyadhari. It extended from Dhapa to Bamanghata where it joined the Bidhyadhari and moved further south to the Samukpota and Tardah. This Central Lake Channel was affected by the construction of the Dhapa Lock in 1883.

c. Tolly's Nala: The Tolly's Nala was originally called the "Adi Ganga" (original Ganga). It begins at the Hugli, Dholghat Bridge. It passes through the Khidderpore becomes bifurcated near Kudghat and flows along Tollygunj till it reaches Garia. Beyond Garia the flow diminishes till it meets the Bidyadhari at Samukpota. Mr. William Tolly, a major in the Military service, re-excavated the canal in the years 1770 to 1777. It was constructed with a loan from the Government and was leased to him for a period of twelve years within which he could collect the toll from it. After his death it was extended for another 15 years to his widow Anna Maria Tolly. (Bandopadhyay, 1990). The other part of the

southern canal proceeds from Kudghat up to Sundarbans passing Sonarpur, Canning, and Matla river. This canal is a major source of water for irrigation agricultural lands it passes through.

d. Eastern Canals: It was a natural creek extending across the Circular Road till 1810, thereafter, the creek was widened till it joined, the Old Dharmatala Drain which carried the water into to the Salt Water lakes. This "Old Eastern Canal" from Circular Road to the site of the present sewage pumping station of Entally was converted into a large brick lined tunnel for draining the storm water of the city while it also came to be known as Belehata Canal.

e. The Municipal Drainage Channels: There are two Municipal Drainage Channels, the dry water flow and the storm water flow channels. The dry weather flow channel originates at Topsia Drainage Pumping Station. It carries sewage and effluents to the Kulti River. The Dry Weather Flow channel is supposed to carry silt free water to the Kulti River. The silt was supposed to be utilized as fertilizer. It has a full load discharge of 670 cu ft per second, against maximum requirement at the time of its construction of 272 cu ft per second. It has a width varying between 6 to 10 meters and a depth of 2 meters.

The Storm Water Channel originates at the Ballygunj Pumping Station. It also passes through the Bantala tank. It has a much higher carrying capacity of 2270cusecs, with a breadth of 50 meters and a depth of 4 to 6 meters. It runs parallel to the Dry Water Flow Channel on the BN Dey Road for a distance of 50 kilometers. Water from these two channels is used for irrigation and pisciculture. Parallel to the Dry Weather Flow Channel and the Storm Water Channel run the Fishery Feeding Channel from Topsia area for the specific purpose of supply of nutrient laden water to the Bheries.(Ghose)

The Samudgiri Khal was excavated earlier to connect Tolly's Nala near Samukpota with the Storm Water channel, for irrigation and pisciculture in the Tardah -Kapasalthi area. It was partly excavated by voluntary organizations but the lack of funds did not yield the desired result. The discharge at the terminal point of these channels i.e. and DWF is estimated at 4000 cusecs.(Ghose)

Canals in the Development of the Metropolis

The city of Calcutta evolved over three hundred years to its present state. The city's growth has been initiated by the merger of the three villages British presidency and a major trading centre. Munshi, suggests, that the neighbourhood of Calcutta was already an important center of production and commerce with several populous villages filled with cloth manufactures when Charnock set his mind on the site. The other reasons put forth, were the invasions of the Marathas, a good anchorage for the ships and a proper site, which could be developed into a fort without much costs to be incurred.

Initially the stretch of the city was restricted between the Adi Ganga (Tolly's Nala of later years) and the Circular Canal. With the passage of time gradually the Bagjola and the Eastern Canals came within the purview of the city. The ever expanding city engulfed all the adjoining areas around it.

Listed below are some of the archival references regarding the canals of the Kolkata city:-

- 1775-1777, Major William Tolly who was in service of the East India Company at Fort Williams canalized the Adi Ganga from Hugli at Hastings to Garia , a distance of 8 miles towards the East. The canal officially opened to traffic from 1777.
- The result of this excavation as suggested by Ghose and Sen was that the headwaters of Bidhyadhari being diverted and siltation increased in the lower reaches.
- The eastern canal was a shallow channel partly dry at low water extended from Dhapa along the Salt Water Lake to the Chadpal Ghat on the Bhagirathi (Hugli, today) across Entally, Circular Road and the Creek Row.
- 1800, it was choked from the Circular Road to the Chadpal Ghat, in 1810, the excavation of the Circular canal took place. It was supposed to provide an alternative approach to Calcutta

for the boats coming from the East. It was also to improve, widen, and lengthen the existing canal westward.

- 1821, Mr. Schalch, the Deputy Assistant Quarter Master General stressed on the need to relieve pressure on the Tolly's Nala and proposed the extension of the Beliaghata
- Canal to the Hugli at Chitpur with lock gates. The Circular Canal was excavated in 1831.
- The Government accepted these recommendations and the constructed lock gate was opened for traffic on the 10th of August, 1881. The Chitpore lock was ready for use on the 14th of February 1883.
- The construction of the artificial canal as Calcutta storm water and sewage was undertaken and discharged into the Eastern Canals below Dhapa.
- Another interesting development of this phase was the issue of link canal between the two major canals, Circular and Tolly's Nala. Though the canalization of the Lake Channel fell through bureaucratic issues, it later silted.
- In 1904, the first alarm was sounded on the rapid degeneration of the river Bidhyadhari.
- To eliminate the longer route, a much shorter Krishnapur Canal was undertaken in 1910. It joined the New Cut Canal with the Bhangore Khal. This cut off more than 78 sq. km of spill area of the Bidhyadhari. The second warning of the state of the river was given in 1913. In 1928, the Government of Bengal finally declared that it was becoming impossible to maintain the river any further. In 1935, it was decided that the sewage and the storm water of the city be discharged in the Kulti river (East of Bhangar Kata Khal). The river disappears from the region in 1942.

The early part of the twentieth century saw a major shift in the role of the canals. With the advent of faster means of communication and the degenerating nature of the canals navigation received a setback. The canals played a new role as carriers of city's refuse into the Bidhyadhari-Kulti systems. It also provided waters to the Bheries of Eastern Calcutta. Further constructions were made to enhance this role. The Dry Water Channel and the Storm Water Channel were likewise constructed to carry city's waste and rainwater.

Repercussions of the spatial expansions of the Megacity on the Canals

The unprecedented growth of the city along with the degeneration of the canals within a span of 150 years has caused repercussion beyond the estimation of the average planner.

- The excessive population dependence has caused greater amounts of sewage generation which get carried along the canals. This has damaged the fragile ecosystem of the canals.
- Demographic pressures have also pushed people to live on the canal sides causing a unique socio-cultural environment near the banks. The author has conducted extensive study on these encroachers and their impact on the environment.
- As the river Hugli is a tidal river the canals originally were flushed by the tides. Inadequate water depth, broken lock gates, excess sedimentation, sludge from sewage have culminated in causing a near stagnation of the water in the canals.
- Spread of diseases from the canal waters is also a cause of concern. The high coliform levels of the waters due to the disposal of sewage and the active spread of tropical diseases like malaria are chief effects that need to be addressed.
- Increased water logging in the city particularly as the city lies in the eastern parts which receive an annual rainfall of 160 cms. In certain years, the *Bhora Kotal* (tidal wave) coincides with the onset of the rains. This leads to intense water logging in the areas.

- The degeneration of the Bidhyadhari, the easternmost river due to ill planned dredging and canalization in the early 19th century is geomorphologic disaster. Presently the sewage and the storm waters are being diverted into the river Kulti another distributary of the Hugli.
- The closing of the *bheries* of eastern Kolkata wetlands and the destruction of the natural system of recycling of the sewage in them caused an biological chocking of the city and the waste waters.
- Excessive development of the city towards the East and the North and the filling of the canals, erosion along the banks, and misuse of the canal waters have distorted the very purpose of the construction and maintenance of the system.

CONCLUSION

Cities are ever expanding urban nodes. To stop the process is difficult. It is always a challenge for the urban planners to reinvent their planning strategies. The city of Calcutta or Kolkata is no exception. The city 's growth in demographics have been inevitable which has been followed by the pressures on the existing infrastructure. In the 19th century the canals in the city were largely carriers of trading commodities. With the passage of time they have become carriers of sewage and storm waters of the city. This has its own environmental complications which need to be studied. The anthropogenic impacts are not reversible hence it should be the objective of the present planners to rework on the plans of the canals. Apart from resettling the canal side residents, reopening the waterways and treatment of the sewage through the older fish farming techniques need to be looked into. As a legacy of yesteryears one can hope that the network is preserved and converted to the benefit of the growing urban population of the city.

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