GANGA

Newsletter No. 20; IRBMS; March 2011

Embankment on Tista near Jalpaiguri Town

River basins are ecosystems which has interdependent biotic and abiotic components. This interdependence has an inbuilt mechanism to stabilize the ecosystem within certain limits. The changes of its various biotic and abiotic components have a long term impact on the system and its stability. Unfortunately during the economic development we fail to realize this ecosystem paradigm. As a result, it not only affects the river basin ecosystem but also affects its one of the very important components, human society on the basin.

The time has come when instead of looking for blind short term economic development -let us evolve into an 'Ecosystem based Economic' development paradigm for a truly sustainable development. A shift from linear developmental mode to cyclic system oriented natural mode. Instead of exploiting the natural resources, let us learn to live in

harmony with nature. The Indian rivers are extremely stressed with linear developmental pressure. Let all of us rise to the occasion.

River linking in Western India

River linking at regional level has already been initiated by Gujarat and Maharastra Government. They have signed a MOU of the Par- Tapi -Narmada River link which envisages a series of seven dams on six rivers in these states.

These project associated dams, tunnels and cannels are set to submerge an area of about 18500 acres which includes 75 villages and partly or fully displace over 25000 people mostly tribal. Many communities like 'Par Nar Adivasi sangathan' and '208 Service' opposed this river linking project. They are trying to make the affected peoples of two states spread over three districts aware of the situation. They conducted rallies, meetings, street plays and showing films to protest against the project. The communities are set up by the youth of these affected areas. The secretary of the group told that the protestors are against the project to be implemented by the government. They also stated that they will not allow for surveying the area or any other project related work. During this programme the peoples of the affected areas are surprised to see that the world's largest democracy has no place for dissenting opinion of its weakest constituents.

(Source: Dams, Rivers & peoples; vol.9; issue 1.)

Bengal Rivers

(Continued from Newsletter-19)

Alluvial and Deltaic Plains of South Bengal

The vast Ganga-Bramhaputra delta is known as Bengal delta. Geomorphologically, Bengal delta can be divided into four geomorphic units viz i)palaeodelta, ii)subareial delta, iii)transitional unit, and iv)marine unit.

Palaeodelta occupies the western and northernmost part of the main delta body, west of the Hoogli River, north of the Ganga and east of the Bramhaputra River. To the west, it is bounded by the Precambrian rocks of Chotonagpur Plateau. The delta of Damodar river in South Bengal forms lobes. These lobes are indication of the indented palaeoshore lines and funnel-shaped palaeochannels. These suggest the dominance of tidal process during the formation of palaeodelta.

Subarial delta this unit is restricted between Ganga and Bramhaputra rives-to the north and east, and Hoogli River to the west. It consists of; i) the upper flood plain-which is the fluvial flood plain where the river shows the meandering and channeling in the main

stream, ii) the lower flood plain, which is the zone of interaction between the river and the oceanic tidal processes. It shows important landform units viz.tidal channels of degraded nature.

Transitional unit is an intermediate zone between the fluvial and marine regimes, dominated by tidal activities. It is connected to the sea through a network of tidal channels and creeks. The tidal channels migrate freely in the tidal flats, and capturing one channel by another is a very common feature. Estuaries form another landform in this unit.

As regards marine unit, bathymetric charts of naval hydrographic surveys are used for interpretation of submarine part upto 250 km.

Shoreline of West Bengal: A narrow stretch of about 60 km. long shore extends from Hoogli River estuary to the NE of Subarnarekha River. This part of the coastal plain is generally an area of marine deposition, except near the estuaries of Subarnarekha. Subsurface exploration around Digha Coast encountered mainly three formations viz. i) thick upper formation of plastic clay and well sorted medium grained sand, ii) the middle formation, consisting of coarser sand with laterite concentration; and iii) lower formation, having well sorted sand, alternating with clay beds.

The regional feature of erosion-deposition pattern indicates that the shoreline, East of Digha such as Shankarpur is relatively stable, while that to the west has been pushed northward due to marine erosion around Digha.

(Source:Bengal Basin by R.k.Roy & G.S. Chattopadhyay)

Diversion of Rivers in West Bengal Perspective

Last part

As stated in previous issue, the main flow of river Tista joins with River Jamuna in Bangladesh which in turn joins with river Meghna to flow into the sea. But during early part of Nineteenth century Jamuna is diverted towards west and one of its main branch joins with River Padma. The diversion of all these rivers are basically dependent on neotectonic effects on Ganga-Brahmaputra-Meghna delta. The river Jaldhaka on the other hand, has been converted into a low-gradient river after coming down from the foothills to the floodplains of N.Bengal. Due to this low gradient, the river cannot further carry the accumulated sediment mainly consisting of pebbles and gravels on the river bed. The flow course of the river becomes much shallow, thus changing the course again and

again, making new turns and branching out in two or three directions-making a network of channels in lower part of the basin. During the last two centuries, the River Torsa has changed its course many a times in Coochbihar from west to east. The present course near west of Samchi is more or less stable. Diversion of rivers in south Bengal, on the other hand, is very common, particularly in the eastern sector of river Bhagirathi. Rivers in western part have a gentle gradient towards south- east, joining with river Bhagirathi, whereas the rivers in eastern part trending towards south, either joining with trunk channel Bhagirathi in an acute angle or directly meeting the sea towards south. Among the rivers in western part the river, Damodar has so many diversion histories. In the middle of the Eighteenth century, the river deserted its old easterly course and the main stream followed its present direction towards south, joining with Hoogli near Falta. Rennell in his map of 1760 referred to the Kana and Kunti nadi as the old Damodar course which has been deserted in later course. Besides Damodar, other rivers in western sector of Bhagirathi have no such major shifting changes. The rivers in eastern part are occasionally changing their courses. Saptagram Bandar, once a famous port during Sixteenth century, along bank of river Saraswati, near Triveni is now in pages of history. Presently the river has been totally silted up, River Jamuna one of the main streams at Triveni sangam, once used to flow south eastwards joining with river Ichamati—now completely dried up- only a small branch Marali is active during monsoon. River Bidyadhari, once a major distributary of river Bhagirathi, was a navigable river in the long past. Port city Chandraketugarh was established once along its bank. At present the river has no existence at all, besides a few meander cut-offs. East Calcutta wetland occupies the major part of the floodplains of river Bidyadhari. Other distributaries viz. Jalangi, Mathabhanga, Churni, Ichamati are on the verge of being silted up, except in monsoon.

Causes of the diversion of the rivers is either attributed to neotectonic activities in the recent past or major faults present in underlying basement rocks or due to huge sediment load on the river bed itself and subsequent flooding. The shifting of river course is very much a natural phenomenon. From time immoral civilization in Bengal Basin has changed its history with the changes of these rivers. Many such civilizations remnants are seen in Bengal basin.

Indo-Bangla Teesta water sharing pact

The water sharing of Teesta River is the bone of contention between India and Bangladesh. Recently India and Bangladesh organized a secretary level meeting of the Joint River Commission in Dhaka for an agreement on sharing of water from Teesta and Feni Rivers in the lean season. The agreement signed for the next 15 years. The meeting also highlighted on the working plan on the sharing of waters of some other common rivers like: Dharala, Dudhkumar, Manu, Khowai, Gumti and Muhuri. The agreement was signed at the presence of Indian Prime Minister during his Bangladesh visit.

(Source: The Hindu 12.1.2011)

Ganga the Eternal River

Part-17

Falgu

The fertile soil of central Bihar have evolved largely on the alluvium of the Son and the several smaller river systems, namely the Karmanasa, Punpun, Phalgu, Panchane, Sakri, Harohar, Badua and Chandan draining the northern slopes of the Chotanagpur Plateau. Falgu is a very important tributary of Ganga.

The Falgu River (also spelt Phalgu River) originates from the south in Chotonagpur plateau at 221 m above MSL and it reaches river Ganga in the north at a height of 63 m above MSL. This famous river flows past Gaya, in Bihar, is a sacred river for Hindus. The city lies near the junction of the Gangetic Plain and the Chota Nagpur plateau. Falgu is having two tributaries namely Lilajan (also called Niranjana or Nilanjan) and the Mohana, two large hill streams each of which is over 300 yards wide. These two streams join two miles below Bodh Gaya, and form Falgu. The Falgu is also known as Niranjana. The united stream flows on to the north past the town of Gaya, where it is very wide.

The famous Vishnupad Mandir is situated here with many minor shrines around it. In 1787 Queen Ahilyabai Holkar, who belonged to the ruling Holkar family of Indore, built the Vishnupad temple (Vishnupad, footstep of Lord Vishnu) in Gaya. It then runs in a north-easterly direction for about 27 km, and opposite the Barabar hills it again takes the name of Mohana, and divides into two branches which eventually flow into a branch of the Punpun. The Falgu like the confluent streams, Lilajan and Mohana, is subject to high floods during the monsoons but in other seasons of the year it dwindles to an insignificant stream wandering through a wide expanse of sand.

Chat Puja in Falgu

In this holy site pilgrims make offerings for the souls of their ancestors. According to the Gaya Mahatmya, of the *Vayu Purana***,** the Falgu is the embodiment of Lord Vishnu himself. According to Hindu belief, the soul wanders after death until *pindadan*, or religious service seeking salvation for the dead from the cycle of rebirth, is performed. *Pindadan* is traditionally offered on the banks of the Falgu at Gaya. Many Hindu devotees after offering *pindadan* shave their heads and take a holy dip and head for the Baitarni pond. The prayers are performed at the Vishnupad Mandir. Thousands of Hindus visit Gaya for the purpose of *pindadan.*

As per Hindu mythology, Sita who was wife of Lord Rama had cursed the Falgu River. The story goes that on account of this curse, Falgu River lost its water, and the river turns simply a vast stretch of sand dunes.

Vast sand bed of river Falgu Photo by Polina Osipova

As per the mythology Lord Rama, along with his brothers and Sita, came to Gaya to perform the sacred rites for his father, Dasaratha. When the brothers were bathing in the river, Sita was sitting on the banks, suddenly, Dasaratha appeared out of the sand, and asked for the Pinda. Sita requested him to wait till his sons returned but he refused to wait, asking her to give him pinda made of the sand in her hand. Having no other option, she gave him the Pinda he desired. There were five witnesses – the Akshaya Vata, the Falgu River, a cow, a Tulsi plant and a Brahmin. When Rama returned and started the rituals and when Dasaratha did not appear then Sita told them what had happened, but Rama could not believe that his father would accept pinda

made of sand. Sita asked the witnesses to tell Rama the truth. Among the five, only the Akshaya Vata took her side and told the truth, while the others lied, trying to take Rama's side. In her anger, Sita cursed all of them thus: the Falgu river henceforth would have no water at Gaya. She then blessed the Akshaya Vata saying that all who came to Gaya would perform the Pinda pradaanam at the Akshaya Vata too.

During September and October a large crowd comes to the town to perform the last ritual of the ancestors causing scarcity of water. During summer also, there is a crisis of potable water. As a big population of town uses river water, it has been found that all the water quality parameters were within the permissible limits except dissolved oxygen (DO) which was found below the prescribed standard. The study shows that water quality index increases from upstream to low stream along the town area. However, the river water was found safe for human consumption in a 2009 study *(Proceedings of the Zoological Society of India 2009 Vol. 8 No. 1 pp. 123-127).*

As per the Times of India 24th April 2008 report, the nitrate content in underground water in several localities of the Gaya town is as high as 250 mg per litre, as against the maximum permissible limit of 45 mg per litre, the result of public health and engineering department (PHED) of the state government test.

More than 60 per cent of the nearly half-a-million residents of the Gaya Municipality depend on underground water sources. The presence of nitrate and other harmful substances is said to be more in the areas located on the Falgu bank as, besides municipal waste, all the effluents of drains contaminate water sources.

ADB laon to Kolkata for effluent treatment

Asia Development Bank (ADB) has released a loan of rupees 1,300 crore to Kolkata for the development of effluent treatment like development of sewage, water supply and solid waste management projects. Mayor of Kolkata Municipal Corporation in a meeting at Confederation of Indian Industries (CII) said that KMC is likely to invest for the development of river jetties, management of waste land, water supply and effluent treatment projects in the city. He revealed that KMC also engaged with the Delhi School of Architecture to river beautification project along the river banks and signed a MoU with the Indian Railways and Kolkata Port Trust for the same project. He welcomed the private investments for the beautification river bank from Garden Reach

to Kashipore covering around 250acres areas.

Integrated Water Resource Management in Mekong River basin

The framework for the Mekong River Commission Strategic Plan 2006-2010 is integrated water resources management (IWRM). The very important key management principle in the Strategy is to engage with stakeholders at all levels, local, implementation and policy levels.

The Mekong River Commission (MRC) works with the National Mekong Committees in all nations of the Mekong Basin like Laos, Thailand, Cambodia and Viet Nam. The MRC Stakeholder Participation and Communication Plan sets out approaches to engage with a wide range of stakeholder groups at local and national levels.

At the project level, MRC policies allow those who will be affected by a project to influence decisions on project plans, implementation and monitoring.

At the programme level, planning in the Basin Development Programme is participatory. And, to monitor the overall work programme, MRC invites partners (through a formal Memorandum of Understanding) to participate as observers at its Joint Committee and Council meetings. MRC development partners are also actively engaged in MRC decision making through governance meetings.

Many actors in the Mekong Region wish to contribute to MRC goals and be proactive in Policy making. In 2008, the MRC initiated a regional consultation to come up with general principles for stakeholder involvement at the MRC level and a policy on stakeholder involvement in MRC Governance Bodies. This will broaden political decision making processes and ownership, strengthen regional co-ordination between stakeholders and the MRC, and foster accountability.

(Source Global water Partnership A Handbook for Integrated Water Resources Management in Basins)

****

Editor- Sujit Choudhury, Published by IRBMS (© Integrated River Basin Management Society)