GANGA

Newsletter No. 16; IRBMS; November 2010

Sediment deposit in Barakar River - Pic. from Tiliya barrage

Like a very important component of nature river nourishes humanity and civilization since time immemorial. The role of the rivers as the sustainers of life and fertility is reflected in the myths and beliefs of all cultures of different civilization across the globe. And in India such myths and beliefs are numerous. Rivers are considered as mother. River Narmada is known to many as 'Narmadamai', River Ganga as 'Gangamai,' Volga is *Mat Rodnaya*, "Mother of the Land". All the major rivers in India are associated with mythologies and stories. Their origins are considered as the sacred places.

Still our rivers are severely polluted, disfigured and badly managed by the same population. Human civilization has affected its very foundation, the rivers of the world. Why? The answer is not simple but it is very important to get the answer.

River is not the source potable water only, but it is much more than that. The entire land surface across the globe is part of some river basin or others. River water and its water have given shapes of the earth's surface along with air. It is not the landscape we may call it as riverscape. A large number of ecology is associated with different rivers providing life sustaining support to numerous living creatures. These vegetation and animals are integral and are close relations of us. Their destruction is at our own cost.

Narmada Water Dispute Tribunal

Central Government constituted Narmada Water Disputes Tribunal (NWDT) in 1969 to adjudicate upon the sharing of Narmada waters and Narmada River Valley Development under the Chairmanship of Justice V. Ramaswami.

The Tribunal gave its Award after 10 years in 1979. The Award specified quantum of utilisable waters at 75% dependability to be shared by the four States of Gujarat, Madhya Pradesh, Maharashtra and Rajasthan as follows;

State	**Flow**
Gujarat	9.00 MAF
Madhya Pradesh	18.25 MAF
Maharashtra	0.25 MAF
Rajasthan	0.50 MAF
Total	28.00 MAF
(MAF-Million Acre Feet)	

The Tribunal determined that the height of the Sardar Sarovar Dam should be fixed for Full Reservoir Level (FRL) of 138.68 m (455 ft.) and also directed Government of Gujarat (GoG) to take up and complete the construction of the dam accordingly. According to Clause-16 of the final orders of the Tribunal, the parameters of shares of utilisable waters by the States, FRL of the reservoir and Full Supply Level (FSL) of Navagam Canal are made subject to review at any time after a period of 45 years from the date of publication of the Award of the Tribunal in the official gazette.

Interestingly Global Water Partnership in it's "A Handbook for Integrated Water Resources Management in Basins" noted that although the responsibilities of the Tribunal were very precisely defined but the Tribunal did not involve stakeholders or address social or environmental issues that arose during basin development. If the Tribunal had adopted some of the ideas related to integrated water resource management in basin areas as mentioned in the handbook, the process might have been more inclusive and had a wider remit. Now after 31 years it may need further review in the context of integrated river basin management.

Decrease in Groundwater Level

Central Groundwater Board in its recent report stated that out of 341 blocks in West Bengal, 275 blocks are overusing the groundwater in their domestic, building constructions, industrial and agriculture uses. As such, 68 blocks of following districts have been blacklisted for unsystematic withdrawal of Ground water, which has been corroborated by Ministry of Environment,Govt. of India:

Bardwan Dist.- 10 Blocks
Murshidabad Dist.- 22 Blocks
Nadia Dist. -14 Blocks
Birbhum dist.- 7 Blocks
West Medinipur Dist. -8 Blocks
Maldah Dist.-5 Blocks
Hugli Dist.-2 Blocks in

Global Warming & India

In a recent report from Ministry of Environment, Govt. of India, the following alarming forecasts have been made for the Indian context:

- Temperature of Earth will comparatively increase in colder areas such as Himalayan region.
- Favourable conditions for Mosquito germination will prevail in high altitude areas like Jammu & Kashmir, Darjeeling and North-East India.
- Temperature of Earth will rise by 1.7 to 2.2°c annually on an average.
- Water level in oceans will rise 1.3mm per year leading to submergence of coastal areas.
- Himalayan Glaciers will melt at an increasing rate.
- Drought will increase in plain lands, particularly the North Indian plains.
- Rain will be scattered throughout the year.
- Groundwater level will decline gradually.
- Crop production will decrease to a considerable degree.
- Milk production from cow, goat & buffalo will decrease.

The incidence of Malaria and other type disease will increase.

Bengal Rivers

(Continued from Newsletter-15)

Kansabati

The Kangsabati/Kasai river is originated from Jabar dam area Jharkhand, about 50 km northwest of Puruliya. The river has traversed about 140 km along Puruliya dist, around 235km along Bankura and East & West Medinipur districts and mingled with Haldi River and the combined river ultimately joins with Hugli confluence near Haldia in East Medinipur district. During this long traverse – Kumari, Bhairabbanki and Tarafeni rivers have joined with Kasai — the first one at Ambikanagar in Bankura dist, and the last two near Jhargram in East Medinipur dist. Keleghai, Kapaleswari and Kasai have joined at Tangrakhali — and new name of the combined rivers is designated as river Haldi. Kasai river is divided into two sectors near Talbandi in West Medinipur dist. The main course passes southwards through Panskura along Haldi river channel and the other thin course named as Majakosi flowing northwards again get diverted in two parts – named as Palaspai and Durba choti which join in due course and ultimately meet the Hugli. The catchments area of the river Kangsabati is around 11,850 sq km. During high flood periods of the river, the flood discharge finds its way into the Silai River, southwest of Ghatal. It has been calculated that out of total flood discharge of Kasai of around 187,000 cusecs at Medinipur, about 142,000 cusecs spill into the Silai and the surrounding regions is subject to severe inundation during heavy floods. The total average discharge of the Kasai has been estimated at about 7400 millions cubic yards, giving a run off of 60%. Of this, about 4000 million cubic yards finds its way into the Silai and the remainder, which comes into the Haldi, would be about 3400 million cubic yards.

Kangsabati Project: The implementation of Kangsabati project at the junction of Kasai and Kumari rivers at Mukutmanipur in Bankura districts mainly aimed at supplying required amount of water as Kharif and Ravi crop irrigation measures in Medinipur, Bankura and Hugli districts, West Bengal. At a glance, a few details of the Kangsabati dam:

Catchment area of the dam:

i) At the upstream: 3626 sq.km

ii) At the downstream :8220 sq.km

Length of the dam: 11.27 km

Area of the Reservoir: 124.32 sq.km

Capacity of the Reservoir: 105.64 crore cu.m

Water reserved for irrigation: 90.01 crore cu.m

Barrages constructed in the downstream: Silabati, Bhairabbanki, Tarajemi etc.

Lengths of canals:

Main cana	l-	805 km
Branch canal	-	2425 km

During monsoon of 1996,1997 and 1999, when the reservoir water of the dam was about to cross the danger level, about 40, 100 and 40 crore cubic mt. of water were respectively spared from the dam --- and there was a severe flooding and water logging in the downstream areas. Peculiarly enough, there has been no provision of conservation of the surplus water during monsoon from this project dam. As a result, during drought period, there is acute scarcity of water. This is the overall picture of every project of West Bengal.

[*Source: Banglar Nadi Katha—Kalyan Rudra, Rivers of bengal West Bengal District Gazetteers*]

Rasulpur River

The southernmost tributary of Hugli river is Rasulpur river, presently a dead river. It is more like a 'khal'/'Khanri' in present day. As per 'Rivers of Bengal' the river had degenerated severely during 1885 to 1895 mainly due to tidal siltation. The catchment area of this river is spread along 1200 sq.km area around coastal belts of East Medinipur dist. This river is like an estuary where brackish water from sea enters during high tide. The embankments have been built all along the river bank to protect the flood plain from the brackish water of the sea. The Hijli Khal canal joining Haldi River with Rasulpur for navigation in later part of 19th century is now totally silted up and abandoned. Presently the Rasulpur khal is completely silted up, it is now a passage for draining out of monsoon water from its catchment area.

[SOURCES:-Banglar Nadikotha, Kalyan Rudra, Rivers of Bengal, W.B.Gazeteer]

Ganga the Eternal River

Part-13

Gomti

River Gomti, an important tributary of river Ganga and a perennial river of Awadh plain, runs across the major parts of Uttar Pradesh covering nine districts and a distance of approximately 940 km. It drains the area lying between river Ramganga and Sharda in the upper reaches and Ganga and Ghaghra at the lower reaches. Like Ganga and its other tributaries, Gomti with its fertile floodplain has supported the civilization since time immemorial. Important city like Lucknow is situated on its bank. According to Hindu mythology, the river is the daughter of Sage Vashist**.** According to the major religious work Srimad Bhagavatam**,** the Gomati is one of the many transcendental rivers in India

Gomti originates from Gomat Taal which formally known as Fulhaar jheel, near Madho Tanda, about 3 km east of Pilibhit town of Sultanpur district of Uttarpradesh. It is flowing southwards through the districts of Lucknow, Barabhanki, Sultanpur, Faizabad and Jaunpur, of Uttar Pradesh and meets the Ganges River near Saidpur, Kaithi in Ghazipur**.**

Along the upper reaches down to Sathin the banks of Gomti are high and sometimes precipitous, and the bed is well marked.

South of Sathin the river opens out, the high banks recede, and from Mau Atwara onwards the low lands are subject to damage from flooding. There is fair extent of lowland, and the river seems to have altered its course in the past, and looks as if it once ran in a fairly direct line from Fatehpur. At present, however, it winds along in a fairly well defined bed between stretches of lowlying grounds on either side.

Gomti is a very quite river flowing through stable region except periodic flood and not much hazards are associated with this river. Flooding during the monsoon season leads to several problems when it recedes specially due to drying potholes and pits, which host diseases like Malaria and Dengue. Pollution is becoming a major hazard in Gomti. During its course, Gomti receives huge quantities of untreated sewage, agricultural wastes which bring large quantity of pesticides, fertilizers, etc., industrial wastes. All the above significantly affect the water quality. Before reaching Lucknow city, it receives wastes from sugar and distillery industries of Sitapur district. In Lucknow city, various industries like distillery, defence, milk dairy, vegetable, oil, carbon etc are releasing effluents directly into the Gomti. Besides the industrial effluents, domestic wastewaters are also discharged into the Gomti. In Lucknow city, from Gaughat upstream to Gomti barrage, 19 drains are discharging about 200 MLD wastewater into the river Gomti.

Damming effects of Dam on world's large River systems

A report in the Science magazine in 2005 by Christer Nilsson1,Catherine A. Reidy1, Mats Dynesius1 and Carmen Revenga gives a global overview of impacts of dam on large river systems. Over half the large rivers (172 out of 292) are affected by dams, including the eight most biogeographically diverse rivers. Dam-impacted catchments experience higher irrigation pressure and about 25 times more economic activity per unit of water than unaffected catchments.

In 46 large river basin systems large dams are planned or under construction, with anywhere from 1 to 49 new dams per basin. Forty of these river basin systems are in developing nations. Almost half of the new dams are located on just four rivers, i.e., 49 on the Yangtze or Chang Jiang in China, 29 on the Rio de la Plata in Argentina and

Uruguay, 26 on the Shatt Al Arab in Iraq, and 25 on the Ganges-Brahmaputra in India. New dams are also planned for several unaffected river basin systems, including the Jequitinhonha in Brazil, Agusan in Philippines, Rajang in Malaysia, and Salween in Myanmar. River basin systems with weak economies experience greater per-discharge population pressure than economically strong river basin systems, contributing to greater demand for dam construction among poorer basins. As in northern Canada, inter-basin exchange of dam benefits will continue to influence decisions about dam construction. For example, more than 13 dams are planned or proposed for the currently unaffected Salween, the most imminent of which (the Tasang on the main stem) aims at providing international and inter-basin benefits.

The study shows that as demands on water resources increase, the ecological risks associated with large river systems impact more. For example, in free-flowing rivers, biodiversity can persist because organism dispersal can be effective in both upstream and downstream directions and because many organisms are likely to adapt to climate change by concomitant shifts in distributions. But in fragmented and regulated rivers, such dispersal can be strongly limited. These facts need to be accounted for in global planning for sustainable river management.

Restoration of River

A dam is not forever. In December 2008 World Rivers Review: Special Focus on River Restoration shows that today, more communities than ever are considering the option of removing or modifying dams that have damaged local riverine ecosystems, outlived their usefulness, or become a safety hazard.

There is a range of ways to restore a dammed river, from fully removing the structure to modifying its operation.

Dismantling: The complete dismantling of all physical barriers to stream flow is the only way to fully restore the natural flow of the river. This includes peak flows and seasonal flooding. It is the best way to restore passage for aquatic creatures and the transport of sediment and organic debris downstream. Dam removal is usually in phased manner to avoid sudden release of the sediments that have accumulated behind the dam wall over the years. This is the most costly (and rarest) restoration option and decomissioning of dams has primarily taken place in the US and Europe

Partial Decommissioning: Some of the dam remains with this approach. Altering the dam structure will restore certain flow and change the dam's original function.

Modification: Various options have little or no impact on dam function. For example, the addition of fishladders can be used to improve fish access to spawning habitat above the dam without altering the function of the dam itself.

Re-operation: Improving the release of water from dams usually allows the dam to continue with its original functions. Re-operation can improve fish survival downstream by releasing more water from the reservoir during critical times such as spawning season. While more effective management of dams can help to mitigate environmental impacts, it should be noted that many dams around the world presently lack the mechanisms needed to control water discharge. The people of the Mun River in Thailand have also made significant strides in having dam gates opened to restore fisheries.

The river restoration trend is likely to go worldwide more and more. However, as climate change impacts the safety of the dams and the high cost of modifying them leads to serious argument for decommissioning.

****

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