



Missing the river for the dam

By Sudhirendar Sharma

Over 3,465 km of embankments have been built as a flood-control measure in Bihar since 1952, and more embankments are in the offing. When will government realise that it is the embankments themselves that are responsible for Bihar's recurrent floods?



Two million people have been displaced by the flooding of the river Kosi in Bihar following the breach of the river's eastern embankment in Nepal on August 18, 2008. The breach, just 12 km upstream of the India-Nepal border, started out measuring 400 m, but is now almost 1.7 km long. Around 800 villages in Madhepura, Supaul and other districts have been affected.

Each major flood in Bihar causes a flurry of aerial surveys, relief packages and evacuations. Each major flood also results in a reiteration of the old demand for a high dam in the upper reaches of Nepal, a demand that Kathmandu rejects, arguing that neither a high dam nor its exaggerated benefits will favour Nepal.

The truth is that Delhi has got its flood action plan consistently wrong over the years, and so has Patna. Shockingly, it is the flood control measures themselves that have over the years turned north Bihar into a watery grave for millions. Over 2 million people are permanently trapped between the flood control embankments which have been built along the Kosi river since the early-1950s (see a story providing the background on this at <http://infochangeindia.org/200501156863/Disasters/Related-Features/Abandoned-victims-of-the-Kosi-embankments.html>). An estimated 8 million people are faced with acute water-logging outside of the embankments. Strait-jacketing the silt-laden Kosi has actually caused flood-prone areas in the state to increase threefold since independence, from a low of 25,00,000 hectares to a high of 68,00,000 hectares today. No less than 73% of the entire land mass of Bihar remains flood-prone.

The present deluge upstream of the Bhimnagar barrage on the Kosi has only underlined the follies of the embankments.

In March 2008, an independent fact-finding mission set out to investigate the perpetual flooding cycle of north Bihar. I was part of that team. The dilapidated state of the Bhimnagar barrage could not convince us that it could carry its designed discharge of 950,000 cusecs. The east and west bank canals emanating from the barrage are choked by silt, their combined irrigation capacities reduced by two-thirds on account of the defunct silt ejectors.

Sharing preliminary findings with the press, the fact-finding mission had warned: "...not only are floods in Bihar manmade but the worse has yet to come should the political economy of flood control continue to promote 'embankments' as the only solution to the scourge of floods.

Over 3,465 km of embankments have been built in Bihar since 1952. More are in the offing; a Rs 792 crore package to tame the Bagmati has been approved and another proposal to embank the tributaries of the Mahananda at an estimated cost of Rs 850 crore has been planned. The business of embankment-building reflects the politician-bureaucrat-contractor nexus at its best.

The efficacy of these embankments has always been suspect. Engineer Captain F C Hirst, in 1908, had commented, "in recent times, on the left bank of the Kosi, in the Purnea district, private enterprise has copied the work of the makers of the Bir Band, giving temporary relief which, as will be seen later, is probably a menace to future welfare". This century-old observation has proved prophetic.

Embankments may work on rivers that are stable and that carry a moderate silt load. The Kosi, in contrast, is a meandering river with maximum available energy-producing currents. Having drifted 160 km in the past 250 years, the natural tendency of the meandering Kosi disproves the traditional 'steady-state' equilibrium approach of the engineers. Once embanked, the river's incredible silt load only adds to its defiant nature.

The embankments have proven counterproductive in the case of the Kosi, arresting the natural dispersion of sediment on the floodplains. This increases deposition, raising the level of the riverbed and later causing the breaking of the embankments, with resultant floods and water-logging. Thanks to the embankments, the Kosi riverbed has risen by 12-15 feet on account of silt deposition that otherwise would have been spread over the floodplains.

It is erroneous to assume that north Bihar is geographically positioned to remain flooded. Conversely, it's the state's arrogance and misplaced faith in engineering that has stopped these rivers from performing their natural task of land-building. Without the nurturing role of these rivers, Bihar would never have become the centre of

knowledge.

Can a high dam over the Kosi reverse Bihar's misfortune? Like the embankments, the chances of a Rs 35,000 crore project (estimated cost of 269 mt high dam) going wrong are high. While silt deposition by the river is one major issue impacting any dam's lifespan, its proposed location in Nepal's Brahashetra will capture only 78% of the river's catchment, leaving a significant 22% of the flows dangerously unattended.

What then is the option? Having failed to tame the rivers Rhine and Meuse, Dutch hydrologists have come to the conclusion that absolute safety from flooding cannot be guaranteed by technical-infrastructure measures. Adopting spatial flood protection measures, they are now implementing a 'room for the river' approach, with broad political support. It is measures like these that need to be negotiated with Kathmandu, but not before the political lobbies of Patna (and Delhi) get rid of their misconceptions.

(The author was part of an Ashoka Fellowship Initiative fact-finding mission to assess the perpetual flood cycle in north Bihar. The mission included engineers, hydrologists, sociologists and environmentalists)

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