

DOWN THE MEMORY LANE - DISCOVERY OF HYDROCARBONS IN TRIPURA

In early April 1956, I landed in Agartala, the State capital of Tripura, for a reconnaissance of Khowai and Gumti rivers for development of power and irrigation with the engineers of the Central Water and Power Commission stationed there. The hospitality of the project engineers gave me accommodation in their guest room for the day. The executive engineer, Shri S D Nangram later on took me to his adjoining office and brought out the relative maps of the two rivers and indicated the dam sites across them, as made out from the topographic maps. A plan was made to visit the sites in the coming days.

Immediately, the very next day, we took the project jeep and motored down on the Agartala-Assam highway and proceeded to the Khowai river in about a few hours and reached the proposed site after a 10 km walk. There were a low range of hills, trending North-South, and inclined towards east at steep angles made of friable Tertiary sandstone and shales. The dam axis was marked out with the help of the project survey staff. The site had the drawback, that there were no hard sandstone bands for location of the masonry or concrete spillway. After detailed discussion a way was found for location of the spillway in tunnels, to be driven through the abutments. On way to the dam site a number of armed men were sighted running away from one of the villages. We were informed that they were communist insurgents and that they would not harm as we have come for development studies.

But the visit to Dumbura Falls dam site, on the Gumti river was a more complicated matter as it was located on the borders of the then East Pakistan (now Bangladesh). There were only footpaths or bridle paths to the location. This area was full of wild elephants. So, as suggested by the administration, we decided to go along the river by hired boats, with two armed guards. Accordingly we got two hired boats at Udaipur (Radhakishorepur), approachable by cutcha road from Agartala via the Burma Oil Co's Drilling site at Rokhia (of the forties, enroute). Of the two boats one was reserved for the provisions for the trip, the cook, the khalasis and the armed guard. In the other boat were accommodated Shri Nangram, myself and the survey staff. One forenoon, our boat journey commenced, passing the scrub jungle and small villages. As we were proceeding upstream, the progress was slow, we came across a market boat selling provisions to the locals. Journey by boat is very common in Tripura, as in East Pakistan, and the boatmen were migrant

labourers from East Pakistan. After three days we reached Amarapur where we camped in the village school.

After replenishing our stock of provisions and attending to minor repairs of boats, we went along the river to Nutan Bazaar where we halted for the evening, the day being the commencement of the new year celebrations of the tribals and the Bengalis. Celebrations were afoot in the village with music and dance besides local shehnai music. Near about dusk, we heard some trampling sound and a few gunshots. Immediately, the survey staff ran back to the riverside followed by us, where we noticed a wild elephant running away in to the other bank. The armed constables informed that the animal had come for the provisions, smelling them from a distance. They had fired shots to drive away the elephants. We found that the provision boat in smithereens, because of the trampling by the elephant. Somehow we managed to rest that night with the armed guards on our side.

Next morning we conferred with the village elders. And as per their suggestion arranged for plenty of bamboos to be cut from the nearby jungles. With them a raft was made and tied to our main boat. All the supplies were piled on the raft, with the armed men protecting them. Further progress was made by our boat and the raft, which enabled us to reach the Dumbura Fall Rapids after three days. At the night fall we camped in the hutments of the local Sanyasi chief. After resting for a day, we walked upstream nearly 5 km to touch a narrow path in the gorge. Here, after some measurements, a site for dam was marked out by our staff.

On return from the Damsite, the local forest guard, Viswakarma by name, informed us that some inflammable material was issuing out from a north-south flowing tributary of the river on its southern limb. And the water there tasted saline. It came to my mind immediately that it could be an oil or gas show. We hastened to reach the spot and collected water samples. We found a typical minor anticlinal structure with gas seepage either from the top or the sides. Photographs were taken and some sketch maps were made.

On return, Shri Nangram informed the state administration on the same, who rewarded the forest guard with some money. And also issued a press note on the same. I informed the find to Shri K K Dutta, the then Superintending Geologist of Engineering and Groundwater

Division of GSI at Calcutta. Subsequent work was assigned to Shri S.N. Sen my senior colleague, who was doing systematic mapping in the area. He located several more gas and oil shows in Tripura, utilizing the excellent photo-geological map of Tripura state prepared by Stanvac in 1953-54. In the sixties, large-scale mapping was carried out by ONGC and the Russians. Large reserves of

gas and oil were discovered which led to the construction of a gas based power station of a 45 MW capacity in Tripura.

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DISCUSSION

ESTIMATION OF GROUNDWATER POTENTIAL IN INDIAN ARID ENVIRONMENT USING ISOPACH MAPPING TECHNIQUE: A CASE STUDY

by M.A. Khan and Mukesh Sharma. Jour. Geol. Soc. India, v.61, 2003, pp.403-410

R.K. Ray and D.S. Thambi, Central Ground Water Board, NCCR, 2nd Floor, Reena Apartments, Pachpedi Naka, Raipur - 492 001, comment:

Occurrence and movement of groundwater is a complex phenomenon and its estimation requires a holistic approach considering several factors (GEC, 1997), many of which are not measurable directly. The methodology followed by the authors for the estimation of groundwater potential is too simplified and extended, overlooking the dynamism of the groundwater resources. The estimated resources appear to be far from reality. It is felt that the following points require further explanation/consideration:

1. Static Water Level: It is not clear, what the authors exactly mean by 'Static Water Level'. There is no mention in the paper that the water levels pertain to which period/month/season. It gives an impression that the water level remains the same throughout the year/years.
2. As shown in Fig.3 groundwater in nearly 50% of the area is saline and nearly 30% is brackish in nature, whereas in computation of groundwater potential, it has been considered that less than 10% (4.69 km² out of 48.75 km²) area is unsuitable for groundwater development.
3. The interpretation of the geophysical data and its correlation with the hydrogeological conditions is not convincing. At places where the depth to water level is more than the depth to geoelectric bed rock, saturated

thickness has been taken as 1 m, which seems to be illogical.

4. The groundwater potential of Luni Block, Jodhpur District has been estimated as 49 mem per year. This means 49 mem of groundwater gets replenished every year. Since there is no mention of other sources of recharge, rainfall seems to account for the entire replenishable recharge to groundwater. The average annual rainfall in the block has been reported as 362.8 mm. Recharge from rainfall can be estimated using the following formula.

Recharge from rainfall (Rrf) = Average annual rainfall (RF)* Area (A)*Rainfall Infiltration Factor (RIF)

In this case the area of the block (A) = 48.75km² and the average annual rainfall (RF) = 0.36238 m which means the total volume of rainfall falling in the area is 17.68 mem/year of which ET and other losses are inevitable. Even after assuming an infiltration factor (RIF) of 0.2 (Which is on the higher side), the recharge to groundwater is estimated to be only 3.5 mem/year or a meagre 7% of the total estimated resource.

It is felt that no attempt has been made to correlate the estimated resources with the natural conditions or figures computed using other methods.

5. The groundwater potential of the area, which has been estimated as 1.11 mcm/km²/year, has been referred to as limited. On the contrary, it represents a huge groundwater potential. Even in humid areas with highly favourable hydrogeological conditions,