Integrated Action Plan – Irrigation and Flood Control

Bankura forms an intermediate tract lying between the rice-producing alluvial plains of Bengal to the east and the Chotonagpur plateau on the west. According to Provisional Census 2011, 92% of the population of Bankura live in rural areas and they rely upon agriculture and allied activities as their main livelihood source. Agro-ecologically and socio-economically Bankura falls in the poorest region in West Bengal. Annual rainfall varies from 1100 mm. to 1400 mm. But it is erratic and 80-85 percent of the total rainfall is received during the three to four months monsoon period from June to September. Moreover, as the land is undulated and laterite and porous sub-soil usually contains very poor moisture, erratic rainfall becomes a potential threat to the crops. Fluctuating rainfall with intermittent drought spell between two successive rainfalls make the crop, generally the Kharif crop, very vulnerable and affects the yield seriously. In case the drought spell lengthens, it takes a heavy toll on the crop and results into low output and low income. There is a good surface irrigation network under the commands of Kangsabati and Damodar canal irrigation system. Moreover, there is also a good network of River Lift Irrigation (RLI) stations. But these major & minor irrigation facilities have not been able to operate at their full potential due to dilapidated and obsolete distribution network & derelict machinery. Cropping intensity is as low as 147 percent. The district is drained by rivers like Darakeswar, Damodar, Kangsabati, Silabati and Gandheswari. They are mainly rain-fed and their flow is mostly seasonal. Therefore, a huge part of the district is left dry for a long period during the year. The south western blocks, namely Simlapal, Sarenga, Raipur and Ranibandh, are some of the areas with huge irrigation deficit. Due to this kind of situation, a huge number of people migrate to adjoining districts to participate in Boro1 cultivation during the months of March-May and November-December. Therefore, various types of micro irrigation projects have been taken up for these four blocks under Integrated Action Plan during the year 2011-12. Construction and renovation of check dams, construction of irrigation channels, protection walls for riverbeds and excavation of water bodies were some of the focus areas for IAP 2011-12.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Block</th>
<th>No. of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Raipur</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Ranibandh</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>Sarenga</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>Simlapal</td>
<td>5</td>
</tr>
</tbody>
</table>

Total 30 micro irrigation projects have been taken up by various departments. Some of the key projects are elaborated here.

1 A variety of high yielding paddy
Transforming Lifeline – Prosperity Follows

Name of the Project : Construction of Baragadra Khayerpahari check dam
Name of the Block : Sarenga
Name of the GP : Bikramapur
Project Cost : ₹ 16.83 lakhs
Name of the Implementing Authority : Executive Engineer, Agri Irrigation, Bankura

Rationale
These areas of Bankura receive around 1100 to 1200 mm rainfall per annum and the rainfall is very much erratic in nature. The whole rainfall is being received within 60-70 rainy days. Due to varied land slope and undulated land type, the rain water cannot be stored in a short time and goes unutilized as runoff to the rivers. Sarenga block has quite a few micro watersheds of this kind covering large number of villages and finally merging with rivers such as Kangsabati, Dwarakeshwar etc. The free flowing water from upper reaches of these watersheds can be well utilised by constructing check dams across small streams and storing the water for various usage. Check dams are small scale, low cost structures. They are built across a small stream to prevent rain water from flowing away, they check the velocity of water, reduce the erosive force of water, store water in stream courses, increase groundwater recharge and increase soil moisture conditions, thus increasing the post monsoonal flow often by months. This harvested water provides direct irrigation for the surrounding areas through direct lift and ground water percolation. One such small stream flows through the village Baragadra in Kahyerpahari Gram Panchayat. Previously, there was no permanent structure to check the water flow and store water for irrigation purpose. Due to undulated slope, water would runoff and to the river Kangsabati and soil erosion would take place causing change in the course of the stream. Sometimes farmers used to construct temporary water barriers of sand bags to store the flowing water for irrigation. But, that arrangement did not last long and every season they had to construct temporary structure which could not ensure water availability for sufficient period of time. Thus the demand of constructing check dam on the watershed was raised by local farmers and villagers as well. No significant source of irrigation was found in the catchment areas except for groundwater lifting which was costly and most of the farmers were unable to setup
bore wells by themselves. Therefore, it was decided to construct a check dam on the micro watershed at Baragadra village.

**Project Output**

- Dredging has been completed to increase the water storage capacity of the check dam
- A 4 feet high check dam has been constructed to block the water flow
- The guard walls have been constructed and cemented to check soil erosion due to high intensity of water flow

**Post-project Status**

- Concrete stream bed has been constructed to reduce soil deposition over the watershed

**Project Impact**

- The newly constructed check dam will be able to cater an area of 50 acres from Baragadra and Hansabora villages. These areas were mostly rainfed and some farmers were using submersible pumps to lift groundwater. Thus, increased number of farmers will be able to take up irrigation based cultivation and more land will come under cultivation during dry period
- Crop production will be increased as water will be stored in the check dam. This will nullify the effects of erratic rain causing uncertainty and damage in crop production
- Cropping pattern would be changed as farmers would be able to cultivate Rabi crops such as potato, wheat and mustard and paddy cultivation would be resumed in dry months resulting in higher productivity and higher economic returns
Crop variety may also change as some farmers have positively informed about introducing more cash crops during Kharif instead of paddy cultivation.

Availability of post monsoonal flow may ensure increased area under cultivation and more work will be available within the villages resulting in less migration.

Ground water depletion has been a phenomenon in Baragadra. This check dam ensures artificial ground water recharging through percolation resulting in rise of ground water level and availability of water in dug wells and hand pumps.

Cost of land assets has been increased just after construction of the check dam as availability of water for irrigation has opened opportunities for prolonged agricultural activities.

**Way Forward**

- A user committee shall be formed to avoid any conflicts regarding water usage.
- Installation of River Lift Irrigation would enhance the impact of this check dam by many fold.
- A standard system of water blockade should be maintained by the various user committees or forums to avoid conflict over availability of water in downstream.

Sukumar Murmu is a tribal farmer having 1 acre of land in Baragadra village. Due to small landholding he did not have any secure source of water. Agriculture was totally rainfed and paddy was the only crop that he was growing in his land. During Rabi season, he used to migrate to Burdwan district to work as agriculture labour as he was not able to cultivate due to non availability of water for irrigation. Two years back, he faced the problem of uncertain rain and burnt his hands in paddy cultivation in Kharif. He then tried to install a submersible pump bringing fellow farmers together. But, that didn’t materialize either. This year the construction of check dam has brought a new hope that he would certainly be able to cultivate his land during Kharif and Rabi as well. Though he is little apprehensive about channeling the water to his fields, he sounds hopeful to overcome this problem by collectivizing small and marginal farmers to hire liver pumps for water lifting. He also says that if the check dam functions properly, they might get water household use in their dug wells as well.
**Cropping with Confidence**

**Name of the Project**: Construction of protection wall and renovation of Kharujhore checkdam

**Name of the Block**: Ranibandh

**Name of the GP**: Barikul

**Project Cost**: ₹ 23.70 lakhs

**Name of the Implementing Authority**: Executive Engineer, Agri Irrigation, Bankura

**Rationale**
Under the spells of watershed management, many check dams were built to facilitate agriculture in catchment areas. But due to lack of maintenance and continuous soil deposition, many check dams became defunct or less effective. Kharujhore check dam was one of those check dams that were built some 10-15 years back and due to lack of maintenance it became less effective. Kharujhore has a population of 495 and most of them belong to tribal households. Though landholding pattern is varied, tribal households have larger portion of the available agricultural lands. The check dam was built on a forest stream from a nearby irrigation tank. But, continuous soil deposition during the years made this check dam too shallow. During the months of rain, water used to overflow the dam and guard walls of the check dam causing less water storage and flooding of adjacent agricultural lands. The farmers of Kharujhore were generally depended on the water stored in the check dam for irrigation purposes. The dependency on check dam was more enhanced as a River Lift Irrigation (RLI) station was established covering almost 70 acres of agricultural land. Farmers were not much affected in Kharif season but Rabi crops would get hit by the problems of water shortage in the check dam. Some of the farmers complained about shortage of water during potato and wheat cultivation in last two seasons as quantity of stored water was much lesser than previous years. The prevailing situation demanded for redesigning and renovation of the check dam and construction of pucca guard walls.

**Project Output**
- Height of the check dam has been increased to 5 feet from 3.5 feet
- Height of the protection walls have been increased and concrete layers have been laid
Two new 5 feet high sluice gates have been installed to check the water flow through the check dam.

Protection walls have been shielded from heavy water pressure by layers of boulders.

**Project Impact**

- Previously the RLI was able to irrigate an area of 40 acres during the dry months. Now it has been increased to 70 acres of land as storage capacity has been increased considerably.
- Cropping pattern would be changed as farmers would be able to cultivate Rabi crops such as potato, wheat and mustard and paddy cultivation would be resumed in dry months resulting in higher productivity and higher economic returns.
- Ground water level in catchment area would rise due to artificial water recharge from check dam as water percolation would be increased resulting in availability of water in dug wells and hand pumps.
- Changed cropping pattern may result into lesser migration during dry period as farmers would be able to cultivate Boro paddy in their fields.

**Way Forward**

- Local farmers should come together to form a user committee for the maintenance and management of the check dam.
- Opening and closing of sluice gates must be participatory and decisions should be taken after considering the opinions from all quarters.
- Dredging activity should be undertaken by the user committee to prevent further soil deposition.
A Step Upwards

Name of the Project : Construction of field irrigation channel from Desh Bundh to Dhow (Kundupara)
Name of the Block : Raipur
Name of the GP : Mandalkuli
Project Cost : ₹ 35.02 lakhs
Name of the Implementing Authority : Block Development Officer, Raipur

Rationale
Field irrigation channels are mostly small scale structures to navigate water through agricultural fields generally from irrigation tanks or same kind of water sources. These low cost structures facilitate optimum utilization of surface water and ensure uniform water level to adjacent fields. These structures are very useful when water source are far away from fields and these open channels can be used to bring water to agricultural fields from water source. As water flows through the channels, farmers either lift water by pumps or pass water through side trenches. The irrigation channel from Desh Bundh to Dhow was dug by local farmers a long time ago to channelize water from Desh Bundh through agricultural fields towards Dhow village. Farmers of Barogara and Dhow rely upon Desh Bundh for irrigation and for this purpose they dug a 2 km. long irrigation channel to carry water to their farming fields. But due to uneven slope water flow was not uniform and sometimes intensive current would cause collapse of the side walls of the channel resulting in water wastage and free flow of water to the adjacent households and farming fields. Besides, plant growth on and within the irrigation channels used to work as blockades for water flow. Some farmers also used to take advantage of the upstream by digging side trenches over the irrigation channel and water would runoff to their fields leaving the downstream dry. This made the situation worse as conflict arose among farmers. The solution was to construct a pucca irrigation channel considering the slope and water utilization structure.
Project Output

- A 2 km. long concrete irrigation channel has been built
- Channel bed has been leveled and cemented to eliminate the problems caused by uneven slope
- Water passes along the channel have been cemented so that the side walls do not collapse in those patches

Project Impact

- A canal from Kangsabati river is linked to Desh Bundh and it also stores rainwater. This arrangement makes this irrigation tank a hotspot for irrigation. Thus, construction of the pucca irrigation channel ensures water supply to 250 acres of land from Barogara and Dhow villages covering nearly 400 local farmers
- Earlier Boro cultivation would face water scarcity due to low water levels. After construction of this irrigation channel, water wastage can be prevented and it ensures optimum water usage throughout the year
- Chances of conflict among local farmers have been largely eliminated as farmers will not be able to take away extra water from the irrigation channel
Once a Problem Hands a Solution

Name of the Project: Construction of protection wall at Salboni Khal (Canal)
Name of the Block: Raipur
Name of the GP: Fulkushma
Project Cost: ₹16.09 lakhs
Name of the Implementing Authority: Block Development Officer, Raipur

Rationale
Salboni canal goes through Salboni village in Raipur block. Salboni is inhabited by about 150 households. This canal is the main water source for irrigation and due to the canal ground water level of this village is also comparatively high. But, the blessing for many turned to be curse for some. Intensive water flow and a turn in the course of the stream caused heavy soil erosion and collapse of river walls. During the months of rain due to intensive water flow, parts of agricultural fields would collapse into the canal and the stream would change its course. There were several farmers who lost considerable parts of their land to the canal. Therefore, they demanded for a concrete protection at Salboni canal since a long time. They even stalled construction of a slab culvert over the canal on a PMGSY road. Finally, their demands were met as it was decided to construct a concrete protection wall at Salboni canal.
Project Impact
The concrete protection wall has been constructed at Salboni canal. This protection wall has eliminated the risk of any more soil erosion alongside the stream even during the months of rain. It has also ensured that the stream does not change its course every year making the adjacent lands more stable. Even the risk of any damage to the slab culverts due to intensive water flow has been averted. About 10-11 farmers from Salboni village lost their land to the canal and more land was at risk of getting collapsed. But after construction of this protection wall farmers would not lose anymore land to the canal.

Baburam Mandi had 1.5 acres of agricultural land just adjacent to Salboni canal. He thought he was lucky to have water source so near to his lands. But, his luck did not last long as the canal changed its course and nearly 4 kathas of his land was washed away by intensive water force. There were 10-11 more like him who lost their land and most of them were tribals. For a small farmer like him, it was a big blow to lose fertile land like this and still he had the risk of losing more land to the canal. He could not recover the loss even today. Finally, construction of the protection wall made sure that he does not lose anymore land to the stream. Though he still expects that government would compensate for the loss, at least he can cultivate without any risk.
A Step toward Sustenance

<table>
<thead>
<tr>
<th>Name of the Project</th>
<th>Re-excavation of Jagat Bundh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the Block</td>
<td>Simlapal</td>
</tr>
<tr>
<td>Name of the GP</td>
<td>Bikrampur</td>
</tr>
<tr>
<td>Project Cost</td>
<td>₹ 50.00 lakhs</td>
</tr>
<tr>
<td>Name of the Implementing Authority</td>
<td>Executive Engineer, Agri Irrigation, Bankura</td>
</tr>
</tbody>
</table>

Rationale

Jagat Bundh was excavated some 60 years back by landlords to store water for irrigation and various other purposes. Since then it has been the main source of water for irrigation for catchment areas like Dhanisukni, Bhudubai, Kalijam, Asna, Sirsha and some other villages. Jagat Bundh was excavated covering an area of 27 acres. The structure of Jagat Bundh was designed in such a way that water from nearby upland areas and excess runoff from canal of Kangsabati flows directly to this watershed and gets stored. The watershed drains excess runoff water into a canal which was constructed to carry the stored water pass through the villages in catchment areas and ultimately joins with a tributary of another river. The canal was excavated to cover nearly 1000 acres of land from five catchment villages. But since its excavation the watershed has never been worked upon or re-excavated and that resulted in heavy soil deposition in the watershed. Soil deposition over the years reduced the depth of the watershed resulting in reduced storage capacity and there’s been a huge amount of excess water runoff to the canal and subsequently to the river tributary. A reservoir, which was excavated to cater water needs of the catchment areas, became insufficient source of water supply for irrigation. It was not only affecting the agricultural activities but also started affecting water percolation levels and subsequently the ground water table as well. Informants from the catchment villages stated that due to low water levels in Jagat Bundh, the canal would go dry during Rabi season and the time Boro cultivation. The nearest village Dhanisukni was still able to get water in canal but downstream villages like Kaliam, Asna etc. would not get any water during Boro cultivation. People of these five villages had been demanding for re-excavation work since a long. Finally, Integrated Action Plan came into the picture with needed fund allocation for the project and district administration took no time to take the project up as it would have its impact on economy of five catchment villages. Even funds from Paschimanchal Unnayan Parshad (PUP) were also converged with IAP for re-excavation of Jagat Bundh.
Project Output

An area of 1.5 acres of upland within the watershed has been removed and a large area of the watershed has also been re-excavated making it more deep resulting in increased storage capacity and less water runoff.

Farmers of five catchment villages will be able to resume Boro cultivation without the inconvenience of water scarcity.

Rabi crops will get more water and productivity will rise considerably.

Water percolation will be higher and farmers will easily set up bore well for irrigation and hopefully dug wells will also have water for irrigation and household purposes.

During summer cattles and other livestocks will have the access of water as all the farm ponds become dry.

Project Impact