

Medium and Minor Irrigation Works



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Abstract:

As irrigation has been the primary source of agricultural growth in TS, it has always been accorded top priority by the state. Traditionally, the irrigation sector has been the largest consumer of plan funds next to the power sector. Over the years, the state has been able to create an irrigation potential of 4.84 million hectares through major irrigation projects, medium irrigation projects.

TCBTMP (Telangana Community Based Tank Management Project)(Telangana Community Based Tank Management Project is separated from APTSCBTMP(Telangana) after A.P state reorganization.) proposes to renovate about 3000 minor irrigation tanks in 21 districts of Telangana and AP with the assistance of the Government of India and The World Bank. "Irrigation means the action of applying water to land in order to supply crops and other plants with necessary water".

Keywords:

Irrigation, Projects, Tanks, Water, Repairs, Reservoir.

Introduction:

Traditionally, individual farmers have irrigated from wells, groundwater irrigates about 2.2 million ha. About half of that is under irrigation. India is among the foremost countries in the world practicing large scale irrigation through development of its water resources for irrigation, generation of hydropower and providing domestic water supply.

Irrigation potential which stood at 22.6 mha in 1950-1951, has now reached 100 mha, which is about 1/3 of total cropped area, and as a result food production has increased from 50 m tones (1951) to about 208 m tones (2000).The projections for future population and food requirement of the country indicate that the population of India may stabilize around 1.6 to 1.7 billion by 2050 AD and that would require about 450 m tons of food grain annually at the present level of food consumption.

However, to meet the demand of our nation and create reasonable export surplus in the international market, we need to plan production of food grains, to be not less than 500 mtons by 2050 AD Area wise it is necessary to provide irrigation in at least 130 mha for food crops alone and in an area of 160 mha for all crops to be able to meet the demands of the country in 2050 AD and ensure food security.

Types of Irrigation Projects in Telangana:

Irrigation projects in Telangana have been divided into three categories based on the size of the irrigated area i.e. Cultivable Command Area (CCA).

Definition of Cultivable Command Area (CCA):

The area which can be irrigated from a scheme and is fit for cultivation.

A Major irrigation scheme:

A scheme having CCA more than 10,000 hectares is major irrigation scheme.

B Medium irrigation scheme:

A scheme having CCA more than 2,000 hectares and up to 10,000 hectares individually is a medium irrigation scheme.

C Minor irrigation scheme:

A scheme having CCA up to 2,000 hectares individually is classified as minor irrigation scheme and usually include smaller irrigation schemes such as lift irrigation or schemes with water sources like tanks, diversion weirs, and open head channels.

Traditionally, minor irrigation projects and groundwater are under the guidance of the Minor Irrigation Department, while the major and medium irrigation projects are under the Major Irrigation Department. The Irrigation Division Peddapally is working under control of Irrigation circle Nirmal. The Irrigation Division Peddapally is divided in to Three Sub Divisions.

1. Irrigation Sub Division, Peddapally.
2. Irrigation Sub Division, Manthani.
3. Irrigation Sub Division, Dharmaram.
4. Irrigation Sub Division, Mahadevpur.

We visited the following works in the above Division.

1. Boggulavagu Project, Rudraram (v), Malharao (m) of Karimnagar (dist)
2. Kancharla Cheruvu, Begumpet (v), Kamanpur (m) of Karimnagar (Dist)
3. Bakka Cheruvu, Sundilla (v), Kamanpur (m) of Karimnagar (Dist)
4. Oora Cheruvu, Vilochavaram (v), Manthani (m) of Karimnagar (Dist)

5. Korukunta, Gopurapalli (v), Odela (m) of Karimnagar (Dist)

Storage schemes:

Storage schemes include tanks and reservoirs which impound water of streams and rivers for irrigation purposes. After wells, tanks occupy a very important place under the minor irrigation program. They provide nearly two-third of the total irrigation from minor sources in the states of Andhra Pradesh, Karnataka, Kerala, Maharashtra, Orissa and Tamilnadu. The essential features of these schemes are:

- A bund or a dam which is generally of earth, but is also sometimes partly or fully masonry,
- Anicut and feeder channels to divert water from adjoining catchments,
- A waste weir to dispose of surplus flood water,
- Sluice or sluices to let out water for irrigation and
- Conveyance and distribution system.

Importance of Minor Irrigation Tanks:

Minor Irrigation Tanks are the resource complexes for multifarious uses like

- Irrigation
- Drinking water for people & animals
- Domestic use for people and animals
- Recharging ground water
- Fuel wood and timber
- Rearing fish
- Fodder
- Sanctuary for birds
- Silt and sand for construction

Components of Minor Irrigation Tank:

- Tank Bund (Earthen Bund): A bund or a dam which is generally of earth, but is also sometimes partly or fully masonry, which is used to store water.
- Feeder channels: Feeder Channels are used to divert water from adjoining catchments.
- Sluice: Sluice or sluices used to let out water for irrigation.
- Surplus Weir: A waste weir used to dispose of surplus flood water.
- Conveyance and distribution system: Field Channels are used to supply water (entered through sluice) to the Irrigation fields.

Management of Tank Irrigation:

Presently, in most of the states, the smaller tank systems are entrusted to the local bodies such as panchayats unions for maintenance and management while the bigger ones are rested with the government irrigation departments where there is no role for the local bodies in planning and implementing the development works.

However, the tanks are even smaller units which need to be maintained and managed at the hamlet level where panchayats are considered to be bigger administrative units. Also the panchayats with multifarious activities tend to neglect tank development due to lack of manpower and other resources. In some states like MP, Minor Irrigation tanks irrigating below 100 ha. And all Nistar tanks are with Panchayats. It is proposed to transfer Minor Irrigation Tanks even up to 250 ha to Janpad Zila Panchayats. Water Resources Department maintains Minor Irrigation Tanks above 250 ha. Onwards up to 2000 ha. Further large medium and minor tanks are also maintained by Water Resources Departments.

Modernization of Minor Irrigation Tanks:

The tank systems have gone into disrepairs mainly due to long neglect of maintenance.

Heavy silting of the tank bed, choked up feeder channels, leaking and weak bund, leaky sluices and dilapidated surplus weirs and ill maintained distribution channels are the common deficiencies seen in the present conditions of these minor irrigation tanks. These problems are to be scientifically assessed, and a pattern of cyclic maintenance schedule be drawn after the first initial investments for modernizing and bringing the tanks to their original status are made. In this, standard specifications for bunds wherever necessary, improving on the design of regulating devices for the sluices for easy operation, improving the inlets and outlets for smooth flow in transition, improving the designs of the surplus weirs for higher efficiency in discharges are areas where there could be scientific input. A sort of initial financial support from the Centre in the Tenth Five Year Plan is required. This special wing may also look areas of CAD, PIM and WM and develop necessary guidelines and provide training. An awareness campaign against these two evils may help to some extent, but strict laws and their enforcement are necessary.

Methodology:

The surface water which is collected on D/S is stored properly by constructing Tank Bund across streams. The Bund should not have any leakage and it should be maintained to its standards. To maintain and determine repairs estimate of Oorachervu, Bakka chervu, Kancharla chervu, Boggulavagu and Korukunta, proper surveying of longitudinal and cross sections of bunds are necessary.

BOGGULAVAGU PROJECT:

Boggulavagu project is a medium irrigation scheme proposed across Boggulavagu, a tributary of Maniar river of Godavari basin to benefit backward areas of Karimnagar district. The site of the Boggulavagu Reservoir across Boggulavagu is situated about 6.5 Km south west of Rudraram (V), Malhar Rao Mandal, Karimnagar district and 96 Km from Karimnagar at latitude 18°-33'-25.26" and longitude 79°-15'-36.35". The head works consists of 1,660 meters (5,446 ft.) length of earthen dam with 140 meters (459 ft) long H.C. weir at left flank. The regulator is located at right flank with sill at +151.18 meters. The ayacut proposed under the reservoir is 2084 Ha.(5150 acres) consisting of 708 Hect. (1750 acres) wet kharif and remaining 1376 Ha(3400 acres) is I.D rabi.

Scope and Description of work:

The Distributor system of this project is completely deteriorated due to maximum length of Distributor canal system runs in B.C and expansive type of soils, resulting erosion of canals and collTSse of structures. With the above status of the system the legitimate ayacut is not able to get the required water supplies.

Hence an estimate is prepared for Modernization of Main Canal from Kmo.000 to 12.600 and its minors from D1 to D3 to irrigate the legitimate ayacut of 5150 Acres, to increase the efficiency of the system and to accommodate the design discharge for 5150 Acres, the CC lining is proposed for the entire distributor system. With all the provisions like CC lining to canals, protection works to surplus weir, rising of the bund to its standards, etc., the total cost of estimate is sanctioned for Rs.800.00 Lakhs. (SSR-2010-11).



Fig (Outlet weir)



Fig (Sluice)



Fig (Inlet weir)



Fig (Aqueduct)

OBSERVATIONS:

Our Project team has visited Boggula Vagu Project and observed the following points.

- 1.The leakages were observed to the Weir of Boggula-vagu project (fig 2). Hence, the protection works like skin walls and repairs to Apron are under construction to arrest the leakages in weir portion.

2. We have seen the self loader of concrete and have learned its working process.

3. The grade of mix is M20 with 20 mm metal size.

4. We studied about structures like inlet and outlet weirs, canal drops, canal regulators, sluices and Aqueduct.

Kancharla Cheruvu:

Kancharla Cheruvu is in Begumpet (V), Kamanpur (M), Karimnagar (Dist) is a restored tank and maintained by Irrigation Division, Peddapally and is at present under the control of Irrigation subdivision, Manthani.



Fig (Weir and Apron)

OBSERVATIONS:

Our Project team has visited Kancharla Cheruvu and observed the following points.

1. The Weir of the Kancharla Cheruvu is partially washed away. Hence, the authority proposed skin wall which is under construction to the part of weir and washed away part of body wall of weir is reconstructed.
2. We have seen that the Sluice is located in weir itself.
3. The sites of 2 no of weirs provided to this tank are observed.

Bakka Cheruvu:

The Bakka chervu, Sundilla (V), Kamanpur (M), and Karimnagar (Dist) is a restored tank and maintained by Irrigation Division, Peddapally and at present under the control of Irrigation subdivision, Manthani.



Fig (Weir)

OBSERVATIONS:

The Project team has visited Bakka Cheruvu and observed the following points.

1. The Weir of the Bakka Cheruvu is totally washed away. Hence, the new weir is constructed in Place of Old Weir including construction of skin walls to body wall of weir and Apron cut off walls.
2. We have established the FTL Level of the weir at the time of execution with reference to the existing bench mark available at site.

Koru Kunta:

The Koru Kunta, Gopurapalli (v), Odela (m), Karimnagar (Dist). is a restored tank and maintained by Irrigation Division, Peddapally and, of Peddapally Constituency.



Fig (Korukunta chervu)

OBSERVATIONS:

The Project team has visited the Koru Kunta and observed the following points.

1.The stripping, Benching and raising of Bund of the Koru Kunta.

2.Construction of New Weir.

Oora Cheruvu of Vilochavaram :

Oora Cheruvu is in Vilochavaram (V), Manthani (M), Karimnagar (Dist) is a restored tank and maintained by Irrigation Division, Peddapally and at present is under the control of Irrigation subdivision, Manthani.



Fig (Weir)

OBSERVATIONS:

The Project team has visited the Oora Cheruvu of Vilochavaram and observed the following points.

1.The Earth Work stripping, Benching and rising of Bund of Oora Cheruvu.

2.Construction of Skin wall to weir and repairs to weir in other reaches.

3.Construction of new Weir in the reaches of washed away portions

Summary:

1.From the visit of the works, Boggulavagu project (medium irrigation project) and minor irrigation works like Kancharla chervu of Begumpet (V), Bakka chervu of Sundilla (V) , Korukunta of Gopurapalli (V) and Oorachervu of Vilochavaram (V) , it is found that all the works are under progress and are just at the verge of completion.

2.Thus, all the above reservoirs and tunnels will be put to use up to their capacity levels, so as to command the ayacut designated against the each source.

3.It is observed that, the distributor system of Boggulavagu project is completely deteriorated since passing its main canal and distributaries through B.C soil and expansive type of soils, due to which the designed ayacut of 5150 acres could not be irrigated.

4.As such special repairs to main canal and distributaries like C.C lining to canals, protection works to surplus weir and raising of bund to its standards are under progress out of the technical sanctioned amount of rupees 800 Lakhs.

5.It is also observed that the visit for Minor irrigation tanks were subjected to damage due to heavy floods occurred on 30-7-2010.

6.The main reason was heavy rainfall of 195.40mm which was recorded at Kamanpur rain gauge station on 30-07-2010.

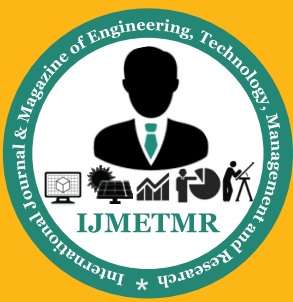
7.The main items of works such as E.W. raising of bunds to their standards, restoration works by attending special repairs like skin walls to project the weirs and construction of new weir (partially) at the places of breaches of existing weirs also attending required repairs to Aprons on U/S and D/S of weir portion.

6.2.Conclusion :

1.The project team is in a position to understand with the explanation of field authority about the investigation i.e., surveys, administrative sanction, technical sanction and execution of works vise Boggulavagu project and other four minor irrigation works.

2.The team is also acquainted with quality monitoring of various items of work like cement concrete , earth work ,embankment works, etc

3.The team also experienced in finding of works done levels of various items of above five works and also learned how to establish the levels for execution of various items of work as per sanctioned estimate standards.



4. On over all the team experienced in preparation of repair estimates to M.I. works, giving marking for various items, as per sanctioned estimates provision and in execution of above mentioned works .

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