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Study for Pipe Distribution Network (PDN) In Aruna Dam Irrigation System

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Abstract - *It is proposed to construct a dam across river Aruna having water storage of 3.30TMC situated at village Het, Tal. Vaibhavwadi, Dist. Sindhudurga. This project comes under "Rest of Maharashtra". It is proposed to irrigate 4475Ha. of Kankavali taluka,835Ha of Rajapur taluka.Thus,it is proposed to irrigate overall 5310Ha. Of land through this project. 2.0 Details of Administrative Approval. It is proposed to construct an Earthen dam having gross storage of 93.378 Mm3 & live storage of 93.370 Mm3 across Aruna river at village Het Tal. Vaibhavwadi, Dist. Sindhudurga. Under this project it is proposed to construct Main canal of length 491.15 m,Right bank canal of 26.50 Km and Left bank canal of length 23.13.On left bank canal it is proposed to construct Mangawali branch canal of length 19.01 Km and Bhuibawada branch canal of length 29.89 Km.It is proposed to irrigate 5310 Ha. land in 15 Villages comes in Vaibhavwadi taluka and 2 Villages comes in Rajapur taluka.*

***Key Words*: gross storage , Right bank canal, left bank canal, branch canal, main canal**

1. INTRODUCTION

Irrigation is very important to fulfill the requirement of grain need for the growing population. As we know population of India increasing day by day it's create the problem to fulfill the requirement of food grain and water supply. PDN is useful to increase crop production. Indian economy is largely based on agriculture and production of crop is depend on availability of water.

It is helpful to avoid draubghtful condition also it is very helpful where rain fall is irregular. Vaibhavwadi is comes under konkan region where high rainfall intensity. Due to high rainfall intensity the pipe distribution system is easily applicable. Pipe distribution network is one of the best option to overcome problem of supply of water for irrigation. Pipe distribution network is helpful to increase the efficiency of project.

1.1 Details of Project:

It is proposed to construct a dam across river Aruna having water storage of 3.30TMC situated at village Het, Tal. Vaibhavwadi, Dist. Sindhudurga. This project comes under "Rest of Maharashtra". It is proposed to irrigate 4475Ha. of Kankavali taluka,835Ha of Rajapur taluka.Thus,it is proposed to irrigate overall 5310Ha. Of land through this project. 2.0 Details of Administrative Approval

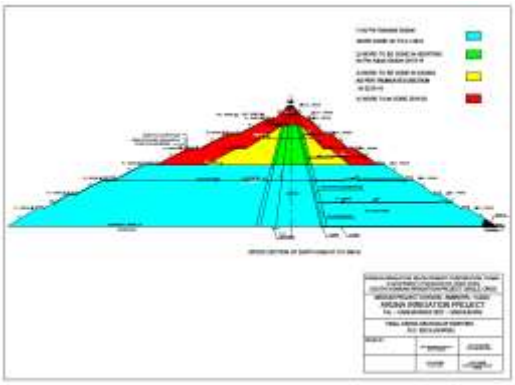

Fig -1: Cross-Section Of Aruna Dam

1.2 General Layout:

It is proposed to construct an Earthen dam having gross storage of 93.378 Mm3 & live storage of 93.370 Mm3 across Aruna river at village Het Tal. Vaibhavwadi, Dist. Sindhudurga. Under this project it is proposed to construct Main canal of length 491.15 m,Right bank canal of 26.50 Km and Left bank canal of length 23.13.On left bank canal it is proposed to construct Mangawali branch canal of length 19.01 Km and Bhuibawada branch canal of length 29.89 Km. It is proposed to irrigate 5310 Ha. land in 15 Villages comes in Vaibhavwadi taluka and 2 Villages comes in Rajapur taluka.

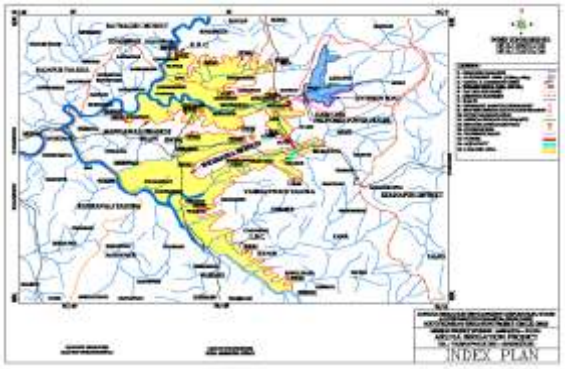

Fig -2:Location Map

Silent Feature

Table -1: Silent feature of aruna dam

Sr. No	Particulars	Description
01	Name of the project	"Study And Design For Pipe Distribution Network (PDN) In Aruna Dam Irrigation System."
02	Scope of the scheme	"ARUNA" medium irrigation project is having two main canals.
03	Source	River ARUNA
04	Location	Toposheet (1)47 H/10, (2) H 12 & 14 Latitude 16^0 36^0 00"N Longitude 73^047^03"E

2. Objectives:

2.1 To study pipe distribution network

Water which is a valuable, Finite renewable and shared resource required by various sections. The best possible alternative to overcome limitation of canal distribution network [CDN] by using pipe distribution network [PDN] system. The main aim of [PDN] is to improve efficiency of water use by PDN method as present water efficiency is 25-40% it can improve to 70-80%by PDN.OPE of an irrigation project improves by the PDN system as it is the one of the best way to increase efficiency.

2.1.1 Pipe material used:

HDPE (high density polyethylene is a thermoplastic polymer produced from the monomer ethylene. It is sometimes called alkathene or polythene when used for HDPE pipes.it is used for avoid to high pressure in pipeline due to high level of impermeability.

2.2. To study advance technique, drawings

2.2.1Vibrating Wire Piezometer:

Installation of Cables and Terminal Equipment:

Piezometer cables must be protected from mechanical damage. The tubes should be looped where they cross an interface and at joints. This reduces strain in the cables and joints due to differential movement.

Fig -3: Vibrating Wire Piezometer

Fig -4: Vibrating Wire Piezometer installation

When there are sufficient piezometer installations to justify use of an instrument house, the cables are led through an entry duct which may be cast into the concrete floor and connected to a switch box or terminal panel attached to the wall. Readings are taken by connecting twin flyleads from the portable readout unit to a common plug-in connection and by switching to respective channels.

2.2.2 Vibrating wire pressure cell:

Pressure cells are used for measurement and control of pressure /stress distribution with in embankment and dams. And also used in measurement of contact pressure on retaining walls /diaphragm walls , piers and abutments and linings of underground excavations.

Installation in Soil and Rock:

The base of the excavation should be compacted and levelled. A trench, 1 m deep and 60cm wide to receive the tubes enters the excavation at mid length. They should be separated from each other by atleast 1 m. Cell locations are carefully marked out, the pockets hand dug and trimmed. Protruding stones are removed and the holes filled with compacted stone-free soil. In rock fill, the pocket for each cell is larger than the soil and is backfilled with thoroughly compacted material of progressively smaller size, until the

material in contact with the cell is of grain size less than 5mm.

Fig -5: Pressure Cells

Fig -6: Pressure Cells installation

2.3 comparative study PDN over CDN

1. This system is buried overall, so that land acquisition cost is minimum as compare to canal distribution system.
2. PDN is most suitable to avoide water losses due to seepage, evaporation, thefts.
3. By using PDN is suitable to irrigate the large amount of area as compare to CDN.
4. Low maintenance cost compare to CDN.
5. PDN is suitable for all advance technologies drip irrigation, sprinklers irrigation, sub surface irrigation.

CONCLUSIONS

It is second largest project in INDIA. Considering the scarcity of water, PDN system is recommended in command area.

This system saves more water as compare to CDN system it is suitable where land cost very high, farmers are unwilling to handover their precise land.

Study of PDN should be carefully done so that maximum benefit of the system can be utilized.

ACKNOWLEDGEMENT

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REFERENCES:

1] Mr. sandesh B. Kulavmode , Dr. S.S. Valunjkar Guidelines for construction of pipe distribution network (PDN) for irrigation Dept. Of Civil Engineering, Govt. College Of Engineering Karad, Maharashtra

2] M. M. Satpute, P. V. Khandve, M. L. Gulhane Pipe distribution network for irrigation – an alternative to flow irrigation

3] Tushaar Shah, Sundrrajan Krishnan, Pullabhotla Hemant, Shilp Verma, Ashish Chandra, Chillerge Sudhir

4] Santosh Patil, S.D. Tlegaonkar, P. T. Nimbalkar Hydraulic design of pipe distribution network for irrigation project

5]Jay Mehare, Rushabh Gore Economics of pipe distribution network over canal distribution network by optimal utilization of water