Case Study on Canal & Pipeline System in Irrigation Project
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Abstract— The project is a minor irrigation project situated on chandi river project in godawari basin, in Tq Nandgaon Kh district Amravati Its distribution system consists of open canals of trapezoidal profile irrigation water transmit via main and branch canal to the distributor by gravity from reservoirs We have designed pipeline system minor at RD 1208 M of main canal. The averaged estimated conveyance efficiency in the irrigation network is considered around 50% due to seepage, leakage, and evaporation They have been used extensively since the 1950’s most buried-pipe distribution systems for surface irrigation operate with a maximum pipe pressure which does not exceed 5 m and is frequently less than 3 m of hydraulic head. Most low-pressure pipe systems have been constructed from non-reinforced concrete pipe, but HDPE pipe materials are now increasingly being used. It was justified that the pipeline systems is easier to automate than an open channel. Also, it was indicated that pipeline systems offer greater seepage control, ease of water diversion, and reduced maintenance. A low-pressure pipeline system is efficient in water delivery and requires less energy head compared with an open channel system.

Key words: Pipe Distribution Network, Canal Distribution Network, Efficiency

I. INTRODUCTION
The project is a minor irrigation project situated on chandi river project in godawari basin, in Tq Nandgaon Kh district Amravati Its distribution system consists of open canals of trapezoidal profile irrigation water transmit via main and branch canal to the distributor by gravity from reservoirs We have designed pipeline system minor at RD 1208 M of main canal. The averaged estimated conveyance efficiency in the irrigation network is considered around 50% due to seepage, leakage, and evaporation They have been used extensively since the 1950’s most buried-pipe distribution systems for surface irrigation operate with a maximum pipe pressure which does not exceed 5 m and is frequently less than 3 m of hydraulic head. Most low-pressure pipe systems have been constructed from non-reinforced concrete pipe, but HDPE pipe materials are now increasingly being used. It was justified that the pipeline systems is easier to automate than an open channel. Also, it was indicated that pipeline systems offer greater seepage control, ease of water diversion, and reduced maintenance. A low-pressure pipeline system is efficient in water delivery and requires less energy head compared with an open channel system.

II. LOSSES
1) Evaporation losses
2) Water logging
3) Percolation losses
4) Friction losses
5) Seepage losses

III. MATERIALS
A. HDPE Pipe
HDPE (High Density Polyethylene) are the used in pipeline system. The pipes life in 100 years. The HDPE pipes are not corroded and not temperature effects. It is used in main pipeline, sub main pipeline.

1) Application HDFC Pipe
   – Lift and gravity water supply systems.
   – Micro & sprinkler irrigation systems.
   – Sewerage pumping and effluent disposal systems.
   – Column pipes for submersible pumps.

B. Altitude Control Valve
Altitude control valves are used in pipeline system. The altitude control valve is fixed near the well. The faction of altitude valve is to control the flow of water and stop the over flow of well. So it was reduce the waste of water. It was operate automatic.

C. Butterfly Valve
The butterfly valve used in water supply for commendable area. The function of butterfly valve are stop the water supply after irrigate the commendable area. It was operated manually.

Fig. 1: Altitude valve
D. Float Valve

The float valve used in pipeline system. It was valve fixed in main canal. The valve workings are the flow of water control not waste are water in wells. The float valve is automatic work. The well are 5m so water control level is 4m, the flow of water decrease in 4m so continue flow but water are increase in 4m so water flow stop.

E. Flow Chart of Pipeline

![Flow chart]

Fig. 4: Flow chart

F. Observation

The pipeline is design with various diameter as per given discharge. Their pipes are provide any particular gradient through which water flow by gravity and required velocity is maintained in pipe to achieve pressure at every outlet. From the comparative study of canals and pipe line system we come to know that overall efficiency of the project will increase by 23% as discharge as required case of canal system is 0.162 m$^3$/s which reduce the losses.

The all overall cost for considered distrubatory including minors in case of canal system is about 23lacs while for pipeline system is about 52lacs. But the average annual cost of project for long term in case of pipeline is about 1 lac and for canals is about 5lac. Which means in case of pipeline system cost of project is less as compare to the canal system.

IV. Conclusion

water logging in command area and to save the soil from losing its fertility, in addition to increase in command area and optimum use of water. So if we can replace overall canals, distributor and minors by pipeline system it will be more feasible to reduce The pipe line systems are also flexible to the users, have a higher distribution efficiency, and easier accurate water measurement. Hence, the future detailed study by water resource department may validate the conclusion.

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