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ANALYSIS AND CAMPARISON BETWEEN CANAL AND PIPELINE OF GOTHANGAON (GONDIA) Water system Venture ”

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ABSTRACT :

The venture is a minor water system venture arranged on gothangaon dam extend in gadavi premise. Tal..arjuni/morgav, dist gondia of maharashtra. We have investigation pipeline framework minor at gothanagaon, gandhari this extend portray comparative investigation another utilize of pipeline framework and canal framework the canal upgraded water system water misfortunes and the yearly taken a toll of upkeep ended up uneconomical for the long term. Simple support, strength, adjustment, capability and adaptability of pipelines allow them term potential to be an temperate elective to supplant the canals. Channels were chosen to build a arrange of the pipeline due to the accessibility of plastic water system pipe and strengthened concrete pipe and their common utilizing water system. They were chosen to develop organize pipeline. The movement and the unsettling influence efficiencies can be expanded due to the establishments of pipeline and water utilize with unlawful outlet can too be decreased by the pipeline framework. How ever in numerous cases the substitution of open canals is done with pipe the different report famous the advantage of by plane this group over open channels system.

Canals upgraded water system water misfortunes and the yearly fetched of upkeep got to be uneconomical for the long term. Simple upkeep, toughness, alteration capability and adaptability of pipelines grant them the potential to be an temperate elective to supplant the canals. Channels were chosen to develop a organize of the pipeline due to the accessibility of plastic water system channels and strengthened concrete channels. This consider has been embraced to examine canal framework and to plan a pipeline framework to supplant it. The think about range is itiyadoh water system venture, found on gothangaon dam gadavi waterway bowl in gondia locale, maharashtra. The generally productivity of pipeline framework was found out to be much superior than open canal framework too the dissemination productivity by utilize of lift water system was found discover out.

KEYWORD :- Canal Dissemination Organize, Pipe Conveyance Organize, Generally Extend Proficiency, Height Control Valve, Comparative Canal Framework & Pipeline System.

INTRODUCTION GENERAL :

The venture is a minor water system extend arranged on Gotangaon dam extend in Wainganga bowl. Ta.Arjuni/mor, Dist Gondia of Maharashtra. We have Investigation pipeline framework minor at Gothangaon This venture depicts comparative examination on the utilize of pipeline framework and canal framework the canal upgraded water system water misfortunes and the yearly taken a toll of upkeep got to be uneconomical for the long term. In channels simple upkeep, solidness, alteration and adaptability provide them term potential to be an prudent elective to supplant the canal. Due to the accessibility of HDPE plastic Water system pipe and strengthened concrete channels and their common utilize in water system, they were chosen to build arrange pipeline. The movement and the dissemination efficiencies can be expanded due to the establishment of pipeline and the water utilize with illicit outlet can moreover be decreased by the pipeline framework. In any case, in numerous cases the substitution of open channels is done with channels. The different report famous the focal points of pipeline frameworks over open-channel system.

The movement and the dissemination efficiencies can be expanded due to the establishment of pipeline and the water utilize with unlawful outlets can too be decreased by the pipeline framework. Be that as it may, in numerous cases the substitution of open channels is done with channels. The different reports famous the points of interest of pipeline frameworks over open-channel system; This advantage can be summarized as follows Reduce misfortunes of water from the framework by drainage and spillage (travel loss), Reduce time of water to stream through the areas (travel time), Increased value of conveyance. Reduce water logging. No need of arrive procurement and development of canal direction works No need of following work for transfer of abundance water Reduce by and large taken a toll of project

RESEARCH BACKGROUND :

A] Arranging:

1. Them to begin with step in arranging a canal framework might be to get day by day stream information of the waterway at the headworks. In case the canal takes off from a supply extend, it ought to outlined for a release which depends on live capacity given in the store for water system and in case it takes off from a redirection work, it ought to be outlined for 75 percent of the stream release accessible as decided by stream curation bends. The stream length bends ought to be arranged for pivotal months at reasonably near interims. For canals taking off from preoccupation work, the consider of release information might decide the sort of canal framework to be arranged and laid out, that is immersion canal, discontinuous canal or changeless canal.
2. After choosing the head release of canal, the zone to be watered by canal framework might be worked out. This should be done by planning arrive utilize maps, ideally on a scale of 1: 15 000, appearing on them range as of now beneath development, soil sorts, residences, streets, drainages, and forms of the zone. The concentrated of water system to be given on the venture might be chosen after taking into account the socio-economic variables for the zone and concentrated of water system being accomplished on other ventures in the neighborhood. The critical crops of the zone and their water necessities should be decided in interview with the division of farming and the agriculturists of the zone proposed to be served permitting for the expected alter in trim design due to presentation of damp cultivating in the range. Knowing in this way the obligation for different crops, the range beneath development region beneath different crops, the escalated of water system, the culturabl

LITERATURE

The post project evaluation of Itiadoh project is taken up with an inter disciplinary approach. The primary and secondary data of the project is collected from the various Government Organizations involved in the activities proposed under evaluation studies. Field observations on the irrigation project are also taken for the collection of field data pertaining to irrigation and allied sectors, which directly or indirectly affect the performance of irrigation project. Field observations on the distribution network is taken up by selecting three distributaries or minors each in the initial reach of 0 to 40 Kms. of main canal, Wainganga branch canal and 40 to 72 Kms. length of main canal. Field observations and measurements have been carried out in the field during the Irrigation period of project. The Project officials, farmers, WUA officials etc. are interviewed with structured questionnaires. The procedure, nature and the type of the data to be collected in the formats was developed by WALMI, Aurangabad which in turn was utilized by the field staff for collecting the data. All the data collected from the field observations, primary and secondary sources is compiled by WALMI, Aurangabad and analysed. The services of external consultants wherever necessary for the collection of primary, secondary or field data has been taken as per requirement. Irrigation System Performance

METHODOLOGY

A) Design of Canal

Various factors like crop water requirement, irrigation methods, water distribution plans, flow control mechanism and social economic settings are considered in determining the design discharge. Tractive force methods (Fortier and Scobey, 1926, Lane, 1955), rational methods are some of the methods in this category. These methods are known as regime methods and the works of Lacey (1930) and Simons and Albertson (1963) are few examples in this field. B) Design of Pipeline According to discharge, we provide 400mm, 315mm, 250mm, 90mm diameter of High-Density Polyethylene Pipe. COMPARATIVE STUDY

WATER CONSERVATION THROUGH MINMIZING LOSESS

Water conservation is one of the prime importance of all irrigation schemes. Not only a suitable method of irrigation is required to reduce losses and make effective use of water, but the losses during transmission of water from source to field should also be minimized.

The amount of water conserved can be obtained by studying the amount of losses reduced. Sr. no Canal type % loss of water Cumulative loss % 1 Main canals 6 6 2 Branch canals 8 14 3 Distributaries 10 24 4 Water courses 20 44 5 Evaporation 15 59

Seepage and Leakage Loss

As per USBR 1978 the seepage losses are given in percentage as shown in Table 1. From that it can be clearly stated that the amount of seepage loss in the pipeline is zero such that there is no loss. Seepage can be reduced by lining of canal. Although seepage is zero in pipe network but there would be some losses due to leakages that may be through joints or over the pipe body in case of cracks in pipelines.

Table 1. Seepage losses in percentage of the canal and pipe line flow (USBR) 1978. Type of canal Seepage losses (%) Unlined canals 20-30 Lined canals 15-20 Unlined large laterals 15-20 Lined large laterals 10-15 Small line laterals 10 Pipe lines 0

Evaporation Losses

Evaporation takes place over the surface area exposed to atmosphere. These losses depend on several factors such as temperature difference between water and air in contact with water, wind velocity and humidity etc. Such losses in pipe distribution network would be zero as there is no exposed surface.

Losses due to Theft

Water theft is possible in both the cases. These can be reduced by strict vigilance and proper metering of supply.

LAND ACQUISITION

Flow of water in Canal is by gravity under atmospheric pressure in open channels. This requires laying the canals over ground at desired slope. These are preferable laid along ridge to have advantage of irrigating on either side. The earthwork is optimized by balancing cutting and filling. This in turn, requires a part of agricultural land of the farmers to put in use for the construction of canals leaving the farmer with a lesser land for cultivation. The land acquisition is becoming problematic with increase in cost land and other reasons. Pipe line system on the other hand take up a lesser space as they can be laid underground and the water can be drawn by using the sprinklers or sprays in order to water the land to be put in use. The pipe lines are usually laid 1 to 1.2 m below the

WATER QUALITY

The quality of irrigation water at source degrades due to the domestic sewage, industrial effluents and atmospheric inputs from fossil fuel burning and bush fresh. Further, contamination due to the use of pesticides such as potassium and nitrates in a high amount, waste from the industrial are as near the agricultural land can affect the quality of water for the usage of irrigational demand.

The canal networks are more susceptible to contamination during transmission of water as people use this water for bathing, washing clothes and utensils. Pipe system being a closed system of water flow can thus help in preventing such contamination that can affect the water quality.

RESIDUAL PRESSURE

This can be defined as the head of water available above the ground level. Higher residual pressure can benefit the farmers in such a way that they can go for sprinkler or drip irrigation as they want without utilizing any energy cost for pumping. In canal

COST EFFECTIVENESS

The costs of constructing the canal system for an area acquired consists of lab or charges for carrying out the works, excavation required for the particular type of distribution system that is being adopted, construction of embankments in case of canal distribution system and the other various construction activities requires a cost per unit associated with the same.

The excavation and clearing out of the area for the removal of shrubs, grass, weeds and other tall grass is common for both types of distribution systems i.e., canal distribution system and pipe line system. In case of canal system, the amount of excavation required is of a wide area in order to prepare the considered slope and the embankments for the same, also the concreting or casting the RCC and PCC for the excavated structure to provide the base for the flow of water are included as direct costs to the project. The costs shall also include the construction of structures such as the concreting work, formwork and the water bed, fixing trenches and filing the area of the excavated material.

Whereas, in a pipe line system, the costs that include are those of the excavation for the width of the pipe line and the depth to which the pipe line shall be excavated. The filling of the area thus excavated, the RCC and PCC for the same to provide the stabilization for the soil and the structure provided for the outlets to the farmers for providing water to their cultivatable land are the main costs that take up a major part in project cost.

Efficiency with field

application efficiencies of 60 to 70 percent. But, in fact, due to various constraints the OPE during operation is only 20 to 35 percent. The overall Project Efficiency (OPE) can be expressed by the following formula. ηo = ηm x ηbr x ηdy x ηmi x ηfc x ηfa Where, ηo = Overall Project Efficiency, ηm = Efficiency of Main Canals, ηbr = Efficiency of Branch Canals, ηdy = Efficiency of Distributaries, ηmi = Efficiency of Minors, Note- All values are in percentage expressed in decimals) From above formula, it is clear that Efficiency of each and every component is necessary to improve to achieve better OPE. the Fig. of Efficiency chart

CAMPARISON BETWEEN CANAL SYSTEM AND PIPE LINE SYSTEM

Sr.No. Points Canal system Pipeline system 1 Water Discharge 0.162 m3/s 0.132 m3/s 2 Irrigation command area (ICA) 57.07 ha. 57.07 ha 3 Losses Transit losses =0.03 m3/s Negligible 4 Initial cost 23lakh 52lakh 5 Maintenance cost (Average annual cost) 4.66 lakh 0.70 lakh 6 efficiency 34% efficiency considered 59% efficiency considered Comparison Graph Between Canal and Pipeline System of Water Discharge. Comparison Graph Between Canal And Pipeline System of Irrigation Command Area. Comparison Graph Between Canal And Pipeline System of Initial Cost. 4. Comparison Graph Between Canal And Pipeline System of Maintenance Cost (Average Annual Cost). 5. Comparison Graph Between Canal And Pipeline System of Water Efficiency.

RESULTS AND CONCLUSIONS

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 Analysis between of canal 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 m3/s which reduce the losses.

The all overall cost for considered distributary including minors in case of canal system is about 23lacs while for pipeline system is about 52lakh. 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. The quantity of water save in case of pipeline is 0.03m/s which can be use for irrigation purpose in nearby area. of main canal, Wainganga branch canal and 40 to 72 Kms. In case of pipeline system by giving permission of lift for quantity of water which will increase save due to pipeline system.

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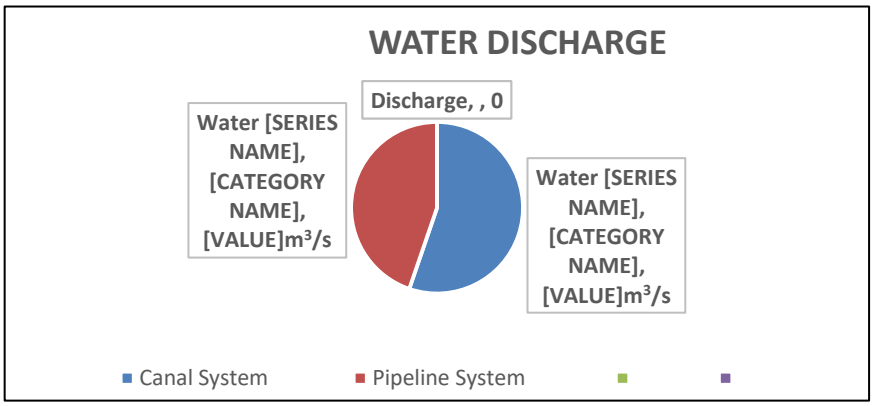
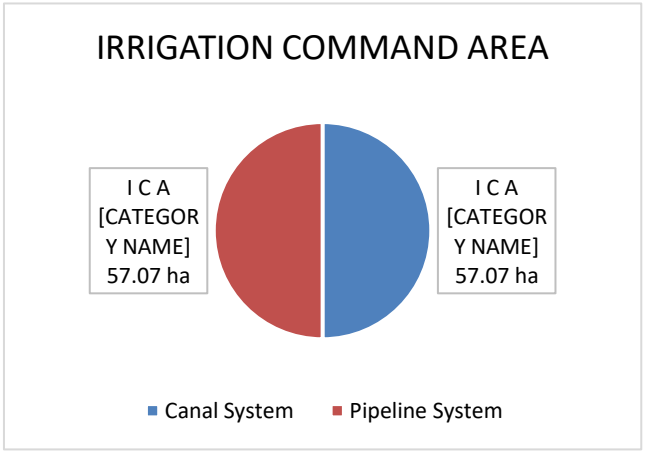
CAMPARISON BETWEEN CANAL SYSTEM AND PIPE LINE SYSTEM

Sr.No.	Points	Canal system	Pipeline system
1	Water Discharge	0.162 m3/s	0.132 m3/s
2	Irrigation command area (ICA)	57.07 ha.	57.07 ha
3	Losses	Transit losses =0.03 m3/s	Negligible
4	Initial cost	23lakh	52lakh
5	Maintenance cost (Average annual cost)	4.66 lakh	0.70 lakh
6	efficiency	34% efficiency considered	59% efficiency considered

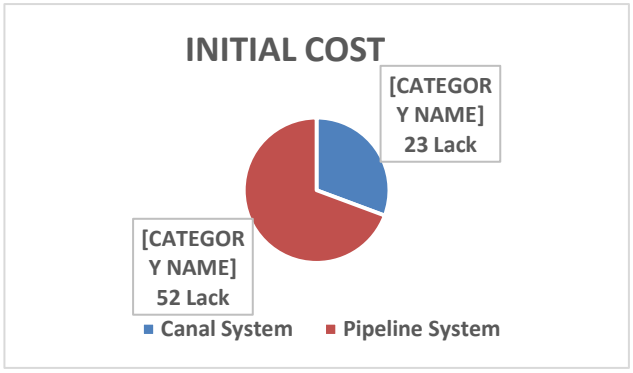
Comparison Graph Between Canal and Pipeline System of Water Discharge.



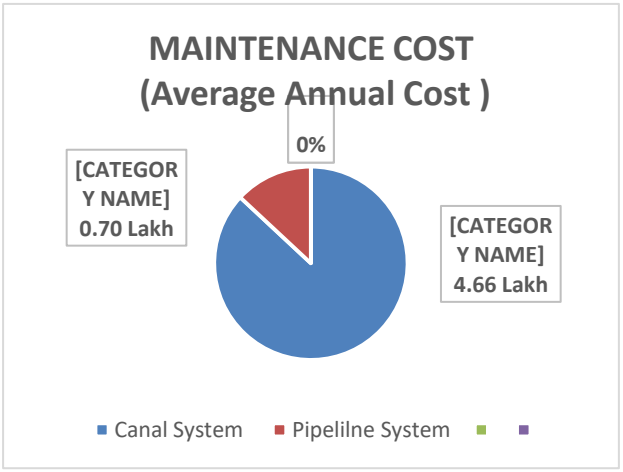
Comparison Graph Between Canal And Pipeline System of Irrigation Command .



Comparison Graph Between Canal And Pipeline System of Initial Cost.



Comparison Graph Between Canal And Pipeline System of Maintenance Cost (Average Annual Cost).



Comparison Graph Between Canal And Pipeline System of Water Efficiency.