

Equal and Proportionate Water Distribution System

Mr.Swapnil .V. Sonawane, Mr.Samadhan .D. Aher, Mr.Prashant .S. Jadhav, Er.Rahul .B. Abhale

Abstract— In India, the National Bank for Agriculture and Rural Development (NABARD) reports that there are many lift irrigation schemes financed by them. These schemes irrigate most of the hectares of land. However, as many of these schemes are defunct, mainly due to poor distribution of water. Other schemes have been financed by individual farmers are on the way of defunct due to poor distribution of water.

In normal systems, the area is divided into three or four equal parts, and each part is given the entire discharge for one day. This means each part gets rotation of the full design discharge on the fourth or fifth day. However water distribution can be unequal, To overcome the unequal distribution of irrigable water by most efficient method i.e. “EQUAL AND PROPORTIONATE WATER DISTRIBUTION SYSTEM” can be adopted. The salient features of this system are: Every farmer gets precisely equal or proportionate water to his area under irrigation and investment at the same time. As per the availability of electricity, as long as the pump is running, all the farmers will get EQUAL and PROPORTIONATE DISCHARGE. The dependability or reliability of the scheme is increased among the farmers. There is no need of an operator. Since equal or proportionate distribution is fool proof, certain and doubtless.

While designing new schemes, we give water on the basis of shares rather than based on crop and area to be irrigated. We therefore decide a shares of water and farmer decides how many shares he wants, and share capital and recurring expenses accordingly. He has then freedom to take any crop and to irrigate any amount of area by using water saving techniques like micro irrigation and mulching etc.

Index Terms— NABARD, Lift Irrigation, Investment , LPS

I. INTRODUCTION

The economic base of the country depends on agriculture. In order to increase the agricultural yield, one should not depend upon rainfall alone. A proper water supply would meet this requirement. Water is an important element for increasing the agricultural production. Natural or artificial

Manuscript received April 13, 2015

Mr.Swapnil .V. Sonawane¹, Student, Civil Engineering department of, Amrutvahini polytechnic Sangamner

Mr.Samadhan .D. Aher², Student, Civil Engineering department of, Amrutvahini polytechnic Sangamner

Mr.Prashant .S. Jadhav³, Student, Civil Engineering department of, Amrutvahini polytechnic Sangamner

Er.Rahul .B. Abhale⁴, Lecturer in Civil Engineering department , Amrutvahini polytechnic Sangamner

application of water to soil for the purpose of moisture and the timely application of water for the growth and production of plants will depends largely on the implementation of various irrigation methods.

Small scale lift irrigation (L.I.) is an important aspect of irrigation development in India. It involves individual or small group of farmers organized and managed by they own. This type of development has often proved successful in areas where the large-scale, particularly government controlled projects have not succeeded. This is not meant that the large scale farming irrigation projects are bad but the small scale irrigation projects are simple to develop and operate. Development of lift irrigation Schemes requires careful design, execution and operation. The perfect management is the key to success of any LI project. Farmers alone have to decide when to irrigate and how much water to supply, when to start and stop the pumps. In such schemes, the most of the schemes are not succeeded due to poor distribution of water. The equal and proportionate water distribution system is the solution of this problem.

In these systems Every farmer gets precisely equal or proportionate discharge at the same time. If the scheme is on the basis of area, and if a farmer has invested for two hectare area, he will precisely get double the water of the farmer investing for one hectare. A farmer investing for six hectare will get three times as much water; and so on. As long as the pump is running, all the farmers will get PROPORTIONATE discharge. There is no scheduling or time table such as so many hours or so many days in a week for farmers or their groups. In this scheme there is no any manual control which creates problems or disputes during distribution of water i.e. No need of an operator. Farmers are grouped for further conveyance through a common pipe line. At the further delivery point, the same type of field distribution tank is constructed, and so on. In main delivery tank, pipes are fitted at precisely on the same level. The number of pipes depends on the number of shares or farmers. The pipes deliver water in to a distribution block. And then through distribution block water delivered through outlets to farmers.

II. BASIC PRINCIPLE

The principle used in this system is very simple and commonly observed. ‘WATER MAINTAINS ITS LEVEL IN A CLOSED TANK’ is that principle. In main delivery chamber, pipes are fitted at incisively at the same level. The number of pipes depends on the number of farmers or shares. The pipes delivered water in to a distribution block. And then through distribution block water delivered through outlets to farmers. The salient features of this system are ‘Every farmer gets precisely equal or proportionate water at the same time’. As per the availability of electricity, as long as the pump is running, all the farmers will get EQUAL and

Equal and Proportionate Water Distribution System

PROPORTIONATE DISCHARGE to his area under irrigation and investment.

III. TECHNOLOGY

In this project principle of energy grade line is implemented. The energy grade line would be at constant level without any losses. The water maintain it's level in distribution tank. This energy grade line is very helpful in our project which distribute water equally.

IV. CAUSES OF FAILURE OF RECENT WATER DISTRIBUTION SYSTEMS

- Planning is based on area or crop which leads to complications
- Distribution of water is unequal either less or more than requirement.
- There are valves are fitted to control the flow, the operation of valves is depend on the worker who has given that work, there is a big chances of corruption.
- If electricity is break down in a day for sometimes then time schedule is disturb causes quarrel among peoples.
- Operation and Maintenance of valves is expensive.
- High investment costs due to circulation of main pipeline among the different farm.

V. NECESSITY

- To eliminates the disputes between peoples due to unequal distribution of water.
- To give lives to the private lift irrigation schemes which are closed up due to improper distribution of water.
- As every one knows that there is only 3% of pure water available on the earth so it's very important to save the water and to distribute it throughout equally to every one.

VI. COMPONENT PARTS OF WATER DISTRIBUTION TANK



Fig: Front View

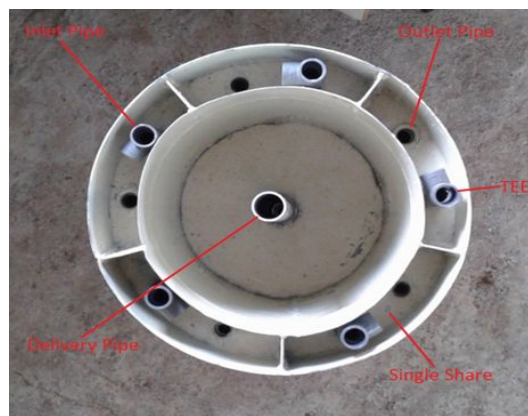


Fig: Top View of Distribution Tank

Functions of Component Parts:

- Delivery Pipe: To delivered water into a distribution tank.
- Inlet Pipe: Through inlet pipe water flows from tank and delivered into the block of share
- Outlet Pipe: Through outlet pipe water goes to the beneficiary field.
- Tee: Tee is provided only for security purpose. By providing Tee any one can't change the level of inlet pipe.

VII. DETAIL WORKING PROCESS

For example, if the discharge of the scheme is 100 LPS and 5 members in the scheme, every farmer precisely gets 20 LPS discharge as long as the pump is running. First of all as pump is running water is flow through pipeline under pressure upto a delivery point and then it is free fall in a distribution tank. Height of tank is taken at higher level than the area to be irrigated. Delivery pipe is fitted at the centre of the tank. The delivery pipe is placed upto a top level of tank. If we design scheme for 5 shares. Then at the bottom side of the tank there are five equal diameter pipes are fitted exactly at the same level called as inlet pipes as shown in fig below:



Fig: Inlet Pipe Position

Then from outer side of the tank from top other small height collar is constructed whose bottom side closed and upper side is opened. Then five equal partitions are made on top and then each pipe is fitted on each partition saperately as shown in fig below:



Fig: Inlet And Outlet Pipes

There is a outlet pipes are fitted on each partition block saperately through which water available for that share passes. As water fall from delivery pipe it is movable which can cause an passing of unequal water from inlet pipes. To overcome this difficulty we provide height to the tank and inlet pipes at bottom side of the tank. By this water is slow down and equally passes through all inlet pipes into each block. The Top level of the all inlet pipe is maintained as per principle of energy grade line. The energy grade line would be at constant level without any losses. As 5 LPS of water discharged from delivery pipe then from all five inlet pipe same water as 1 LPS from each is delivered and passes through outlet pipes to beneficiary farmers. Farmers can stored water of his share and used to any crop in any quantity as per their own requirement.

We can also convert one full share into half or quarter by making different blocks on adjacent of the block of single share. If two farmers want half share then from tank only one inlet pipe of single share is taken into a block, this block does not having a outlet pipe. Then two other blocks are designed on two adjacent sides of this block. From central block two inlet pipes are fitted to adjacent two blocks and maintain level of these two inlet pipes as per energy grade line. Separate outlet pipes are provided for half share. As by this process we convert half share into quarter also. There is no special function of Tee provided at top of inlet pipe but it is only for security purpose. As Tee is provided there is no chances of disturbing levels of inlet pipe because Tee are fitted with locks. If level of inlet pipe is disturbed in few mm then water gets for this share less or more creates quarrel among peoples.

VIII. COMPARISION BETWEEN EQUAL AND PROPORTIONATE WATER DISTRIBUTION SYSTEM AND CONVENTIAL DISTRIBUTION SYSTEM

Sr. No	Equal and Proportionate System	Conventional System
1	Every farmer gets precisely equal or proportionate discharge at the same time.	Water is distributed in unequal quantity, either more or less than design.
2	There is no scheduling or time table. All farmers get their	There is scheduling or time table for distribution. There time table is

	precise share of water as long as the pumps are running.	disturbed when the pumps do not run due to power failure. or maintenance.
3	The share of investment is equal or proportionate.	The share of investment is not equal or proportionate.
4	There is no any manual operation therefore no chances of disputes between peoples. Valves are not needed. Expenses towards the same are saved. There is no question of differences.	There is manual control of valves. Therefore arise differences on operation of valves. Expenses for valves, their operation and maintenance are additional.
5	There is control on used of water	There is no control on used of water
6	Planning based on SHARES of water. The farmer has freedom to take any crop and irrigate any amount of area.	Planning is based on area or crop which leads to complications.
7	Revenue taken from farmer proportionately on share basis.	Revenue taken from farmer on crop or area basis.
8	The cost of the scheme is comparatively less.	The cost of the scheme is comparatively more.
9	Maintainance cost is less and proportionately distributed.	Maintainance cost is more.

IX. APPLICATIONS

- For the rehabilitation of the schemes which are closed up due to improper distribution, thereby reutilizing the vast amount of funds blocked in these schemes.
- Applicable to any size of scheme from two farmers to thousands of farmers or from a few hectares to thousands of hectares.
- For the new irrigation schemes
- We can also used it for drinking water purposes in flat system.
- It is applicable for municipal water distribution in village or city
- It is applicable for distribution from canals also

CONCLUSION

We had concluded that by this system we distribute one single drop of water equally without any conflict. This system includes an innovative technique of water distribution system in which every farmer gets quantum amount of water as per their requirement. This system eliminate the dispute between farmers and minimize the water losses. This system forfend lives of the private lift irrigation schemes which are on the way of defunct due to improper distribution.

ACKNOWLEDGMENT

This project is made possible through the help and support from everyone including: parents ,teachers ,family and

Equal and Proportionate Water Distribution System

friends. We sincerely thankful to parents to provide the advice. This project would not be possible without all of them.

REFERENCES

- [1] <http://www.nabard.org>.
- [2] <http://www.google.co.in.lif/irrigation/schemes>
- [3] <http://en.m.wikipedia.org/wiki/irrigationengineering>
- [4] "[Book Review: Target 3 Billion by A.P.J. Abdul Kalam,Srijan Pal SingluRead.com-Booksionline bookstore9780143417309](#)".
- [5] S.K Garg , "Irrigation Engineering and Hydraulic Structures", 28 th edition revised , 2008 2. B.C.Punmia, Dr.Pandey B.B. and Ashok Kumar Jain,"Irrigation and Water Power Engineering",Laxmi Publication(P) Ltd , 16 th edition.