ANALYSIS OF WATER REGULATION SYSTEM USING PARTICIPATORY IRRIGATION MANAGEMENT

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ABSTRACT

Analysis of water regulation system using participatory irrigation management is done in our project. Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing of agricultural crops, maintenance of landscapes and revegitation of disturbed soil in dry areas and during periods of inadequate rainfall It has been emphasized that proper monitoring and evaluation is the key to successful management. Irrigation system do not supply the right quantities of water at the right time. Irrigation experts are seeking the ways in which the water is used very effectively. In such situation, participatory irrigation management is introduced for supplying required amount of water to the irrigated crops. . Participatory irrigation management is an approach in which farmers participate in all stages of irrigation development through to operation and maintenance and is implemented in many developing countries In our project, we are taking Manivilundhan Lake in Salem district for participatory irrigation management. We have divided the project into two steps. First one is data collection from VAO office and collecting information and got feedback from manivilundhan area farmers. Second step is to provide remedies to them. It includes design of canal lining and cross drainage work and cleaning process. At the beginning, participation concept approach, starting with the result of a study, that the farmers not participate and to take the responsibility, because the infrastructure of which has been built not suitable to the needs of the farmers.

INTRODUCTIONS

The concept of Participatory Irrigation Management (PIM) has been recognized as a tool for improve irrigation management along with sustainability of the system. Irrigation system needs to make water management efficient. However increasing demand of water in all sectors including irrigation made it imperative that the efficiency of the Irrigation Water Management must be increased.

Participatory irrigation management is an approach in which farmers participate in all stages of irrigation development through to operation and maintenance and is implemented in many developing countries. Besides introducing the participatory irrigation management, the government has been preparing several regulation concerning water, Operation and management.

Several model of farmer participation has been implemented, empowering WUA by involved them from planning, design and to some extend even WUA has been acting indirectly as contractor. When the quantity of water became not sufficient as result of the decreasing service

capability of the infrastructure, the farmers just waiting for the government to repair, even or cleaning the lake, while the tight money policy after the economic and financial crisis, the government become more difficult to handle these matter. As the result, so many people speak about the failure of the government in agricultural system.

To avoid this situation, idea about farmers participation rise up. At the beginning, participation concept approach, starting with the result of a study, that the farmers not participate and to take the responsibility, because the infrastructure of which has been built not suitable to the needs of the farmers. So the recommention said, that the farmers must be involve since planning & design, implementation and operation & maintenance system in order to get the participation from the farmers.

Irrigation system need to be restructured to make water management efficient. Thus the Government has planned to involve farmers-users in a more systematic way. In our project, we are considering manivilundhan lake and suppy the required amount of water to the surrounding irrigated area.

We asked feedback from farmers and rectify their problems by cleaning process, design of canal lining and siphon aqueduct, and provide idea for supplying required amount of water.

NECESSITY OF PIM

- Need of increase in agricultural production
- Problem of fiscal availability
- Operation and maintenance cost and recovery of irrigation charges.
- Non availability of water when it is needed, taking immediate problems like leakages, adopting flexibility in water distribution and taking many more initiatives by sustainable proposition, PIM appears extremely necessary and worthwhile.

STUDY OF EXISTING IRRIGATION STRUCTURES IN MANIVILUNDHAN LAKE

This lake situated about four furlongs south-west of no.35,Manivilundhan village in the Attur Taluk .It receives the drainage from its free basin besides the supply from the branch channel taken of from the Kattukkottai main channel and surpluses into the Vasistanadhi river. There is an Anicut across the Vasistanadhi river near Kattukkottai village in Attur Taluk. From above this Anicut the Kattukkottai main channel takes off on the right side.

Above half a mile below the head of this channel, it bifurcates into two branches a small branch to supply the Sarvoi tank and the main branch still called the Kattukkottai main channel, to supply the land of several villages and to certain tanks.

HYDRAULIC PARTICULARS

S.NO.	DESCRIPTION	PARTICULARS
1	VILLAGE	MANIVILUNDHAN
2	TALUK	ATTUR
3	DISTRICT	SALEM
4	WEIR LENGTH	46 feet
5	UPPER PORTION	34 feet
6	LOW BUND	112 feet
7	GROUND ESCAPE	184 feet
8	TOTAL LENGTH OF BUND	4500 feet
	i. TOP BREADTH	6 feet
	ii. SLOPE	1.5 to 1
9	CROSS BUND	610 feet
	i. TOP WIDTH	4 feet
	ii. SLOPE	1.5 to 1
10	FRONT SLOPE OF BUND LENGTH	3780 feet

11	F.T.L. OF LOWEST PORTION	+584.75
12	F.T.L. OF UPPER PORTION	+585.30

DETAILS OF STORAGE

S.NO	DESCRIPTION	PARTICULARS
1	Area of water spread at F.T.L	3.07 mills. sq. ft
2	Maximum with of water spread at F.T.L	1800 ft
3	Capacity of tank at F.T.L	8.84 mils. e. ft
4	Total number of fillings	2
5	Total annual storage	17.68 mils. e. ft

CATCHMENT MAP

WATER WAY FROM KATTUKOTTAI

MANIVILUNDHAN LAKE

IRRIGATED AREA

DISCUSSION WITH FARMERS

FEED BACKS FROM FARMERS

1. Dredging process
2. Land acquisition
3. Canal lining
4. Required supply of water

REMEDIAL MEASURES TO FARMERS

DREDGING PROCESS

The Process of excavating materials underwater and it is used to increase capacity of lake and deepen water ways

LAND ACQUISITION

The process of occupying government land by a local parties for their own purpose that can avoided.

PREVENTION OF GROWTH OF WEEDS

In this lake, there are many weeds are grown and it can be prevented by traditional methods.

CANAL LINING

The earthen surface of channel is lined with stable lining surface such as concrete, tiles, asphalt etc., we adopt concrete lining to control seepage,prevention of water logging .

REQUIRED SUPPLY OF WATER

The required water is supply to the farmers for irrigation.

DESIGN OF CANAL LINING

GIVEN

Discharge of channel = 100 cumecs

Slope = 25 cm/km

Side slope = 1.5:1

Rugosity coefficient = 0.016

Assume limiting velocity = 1.5 m/sec

HYDRAULIC MEAN DEPTH

$$V = (1 / N)R^{2/3}S^{1/2}$$

$$S = 25 /(1000 \text{ X } 100)$$

$$S = 1.5$$

$1.5 = (1/0.016)R^{2/3}(1/\sqrt{4000})$

$R = 1.87$ m

TO FIND AREA

$A = Q / V$

$= 100/1.5$

$= 66.67m^2$

TO FIND PERIMETER

$P = A / R$

$= 66.67/1.87$

$= 35.65$ m

TO FIND WIDTH AND DEPTH

Side slope = 1.5:1

$\cot\Theta = \frac{3}{2} = 1.5$

$\Theta = 0.59$ rad

$A = bd+d^2(\Theta+\cot\Theta)$

$66.67 = bd+d^2(2.09)$ …..(1)

$P = b+2d\Theta+2d\cot\Theta$

$35.65 = b+d(4.18)$ …..(2)

$b = 35.65-4.18d$

\ sub‘ b’value in(1)

$66.67 = d(35.65-4.18d)+2.09d^2$

$d = 0.25$m

$b = 35.65-4.18(2.145)$

$b = 34.65$m

CONCLUSION

- We have great pleasure to present this project report with the hope this humble effort of our will turn to be faithful in the coming future our installation.
- In our project, we are take manivilundhan lake for participatory irrigation management to improve irrigation management.
- We got the feedbacks from farmers in manivilundhan area.
- They need canal lining, dredging process, prevention of landslide and cross drainage works for receiving required amount of water.
- We are got the details from V.A.O office, Manivilundhan and design of canal lining , cross drainage works has been done.
- We have also provided remedy for dredging process for supplying required amount of water.

= 100 / 1.5

REFERENCES

- APERP works executed under Minor Irrigation Sector.1998-99 to 2003-04. Under Irrigation Circle, Nirmal.
- Abstract of Works Proposed under A.P.E.R.P., M.R., O&M for the year 2005-06, Executive Engineer, Krishna Western Division, Tenali.

- Developmental Activities of I.R.Division. 2004-05, Nirmal, Adilabad Dist.
- Government of Andhra Pradesh, Irrigation & C.A.D.Department, Comprehensive Report on Modernisation of the Krishna Delta System, Superintending Engineer, Irrigation Circle, Vijayawada.
- Government of Andhra Pradesh, Irrigation and Command Area Development Department 2005, Irrigation Activities in Irrigation Circle, Vishakapatnam.

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