



Tank Irrigation in Chittoor District : A Case Study of Rayalacheruvu Tank

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ABSTRACT

The tanks are many centuries old and managed mainly by the community as most of the tanks are small in size. The system of managing tanks through community participation is also many Centuries old. But, the performance of tanks has been deteriorating over the years owing to various reasons. Tank irrigation system is less capital intensive and has wider acceptance compared to major irrigations. Tanks can be effectively used for development of backward areas. The tank irrigation system has a special significance to the marginal and small farmers who depend on the tank irrigation. Participation as a process is a dynamic, non-quantifiable and essentially unpredictable element. As a process, participation will change the life of the project into a permanent dynamic movement. Participation of farmers is essential dimension for agricultural and rural development & is one of the crucial components of success in irrigation, livestock, water and agricultural projects.

KEYWORDS

INTRODUCTION

Agriculture is the most important sector of the Indian economy since it contributes about 22 per cent of the national income and is a source of earning for about 68 per cent of the population. The share of agriculture in the national income can be further increased by making rational use of resources and by raising production on the farms through the adoption of new technology. Rapid agricultural development is therefore, sine qua non for sustainable growth and development of the Indian economy. The green revolution has helped to a great extent to achieve self-sufficiency in food grains and through improving the productivity of land, capital and labour. This encouraged the farmers to make sizable investment in agriculture and farming is considered as a business in the recent years. India has the population of 134 crores and with this population and given improvements in consumption levels associated with growth in incomes, the estimated food grain requirement for 2015 will be around 332 million tonnes respectively.

Recognizing the importance of irrigation as a crucial input in India's agricultural development, harnessing of water resources for irrigation has been given an important place in our successive five-year plans. Water management becomes more important in the present century in view of the fact that about 85% of the usable water is diverted for agriculture at present. This must be reduced to 71% in the next 15-20 years. In order to feed the growing population, productivity of irrigated areas must be increased by at least 2 to 3 times. The balance between the supply and demand for irrigation water can be achieved only by improving the level of irrigation efficiency in a big way from about 36% in 1993-94 to 60% by the year 2050. A 10 per cent improvement in the efficiency of water use would be equivalent to adding some 14 million hectares of gross irrigated area. This is particularly so in developing countries like India where the improvement in water use efficiency has been very slow. Technological changes to improve water productivity by raising crop yields seem to hold a better promise in the short and medium terms.

REVIEW OF LITERATURE

Palanisami (2006) Tank irrigation systems of India are a century old. Most of the tanks have, over time, degraded into open access resources due to weak property relations. Encroachment, privatization and government appropriation of

the tanks have been the main outcomes of the failure of local authority systems to enforce the institutional arrangements under the common property resources management regime. About 2% of the tanks in the tankless intensive region and 67% of the tanks in the intensive region have become defunct. Wells that are supposed to be security against late season tank water scarcity have of late become a major threat to the very survival of the tanks. The modernization options derived from a simulation model indicate that software strategies such as sluice management will have a higher pay-off than hardware strategies such as canal lining and additional wells. Policy interventions include physical investments, management and legal aspects.

Narayana Moorthy (2007) reported that tanks are one of the important traditional sources of irrigation in India, irrigating nearly three million hectares even today. Though considered to be a low cost source with few environmental problems, the performance of tank irrigation has been poor and has deteriorated over the years. In this study, using time series data from 1950/51 to 1999/2000, an attempt is made to study the growth pattern of tank irrigation across different periods both at the national as well as across states level, to study the nexus between rainfall and area under tank irrigation at a specific state, which has relatively larger area under tank irrigation, to find out the losers and gainers of tank irrigation among different size of farmers, and to suggest policy measures to rejuvenate tank irrigation in India.

Reddy and Behera (2009) Using 'before and after' and 'with and without' methods, this paper assesses the economic and ecological impacts of tank restoration in three villages in Andhra Pradesh, India. This study finds positive impacts of tank restoration on economic and ecological indicators that unequivocally support the rationale for tank restoration in the drought-prone regions. Moreover, the impact is greater in the case of small and marginal farmers when compared with large farmers, indicating a positive effect/influence on poverty. This study also documents the improvements of the groundwater table in the drought-prone villages and the resultant increase in rabi (the second crop in the agricultural season (December-April)) crop acreage and yield rates. Availability of fodder (ecological impact) has strengthened the livestock economy of the programme villages.

Kadiri Mohan and P.Ramesh Kumar Reddy(2012) in their paper on Profile Characteristics of Farmers under Tank irrigation Commands appraised that majority of the farmers belonged to categories of middle aged(60.56 %), middle school education(32.78 %), 21 years and above farming experience(33.89 %)m medium socio-economic status(70 %), medium level of training received(54.45 %), low level of extension participation(62.22 %), medium level of socio-politico-participation(49.44 %), medium level of mass media exposure(66.67 %). With respect to psychological attributes, majority of the farmers had medium level of innovativeness (6778 %), economic orientation(65 %), empathy(48.33 %), risk orientation(58.89 %)m, scientific orientation(49.44 %) and achievement motivation(70 %).

STUDY AREA

The Rayalacheruvu tank is situated on Tirupati-Pachikappalm Road, 15 kms from Tirupati. The Rayalacheruvu tank was formed during the regime of ‘Sri Krishna Devaraya’, the emperor of Vijayanagaram Dynasty and hence the nomenclature of the tank “RAYALACHERUVU”. The Karvetinagaram Zaminadar maintained the tank after the fall of Vijayanagaram dynasty. The intercepted catchment area of the tank is 41.34 Sq. kms. The free catchment area of the tank is 70.41 sq. kms. In addition to this, there is a supply channel from Kundetivanka north of Pathagunta augmenting supplies to the Rayalacheruvu. The yield available at the site of Rayalacheruvu tank is 1141 m.cft.

Rayalacheruvu Irrigation Tank

Rayalacheruvu tank is a minor irrigation tank located at Rayalacheruvu village about 15 km from Tirupati, in Ramachandrapuram mandal of Chittoor District, Andhra Pradesh. It is a boon to farmers of Ramachandrapuram mandal providing water facilities to more than 500 acres of net irrigated land. A large number of farmers and agricultural laborers depend on this tank for their livelihood producing food and non-food crops. It is one of the major and historical tanks in Chittoor District. The foundation stone was towed and Harihara Rayulu and Bukka Rayulu who were the founders of Vijayanagara Kingdom during 1336-1340 A.D. started construction of tanks with black granite and red soil. But Sri Krishnadevarayulu, who was the great and popular emperor of Vijayanagara Kingdom during the period of 1509-1520, completed its construction. This tank is the major source of water in Ramachandrapuram mandal.

Structure

The height of the tank bund is 80ft, length is 500ft and width is 60ft at the top, 180ft at bed level. The structures inside the bund are a stone fitted passage (gaadi) called Gurappadithoomu connecting the sluices and the stone tub. It has three sluices, one is bed level outlet (Pradhana thoomu) with water regulatory device located in the tank bed adjacent to the bund; connected to gurappadi thoomu. The second is Naidkala gendi, an outlet for the first weir and the third is kukalagendi - an outlet for the second weir located at higher level than the first weir. The original catchment area of Rayalacheruvu is 568.89 acres. But the present catchment area is only 45 acres and 81 cents. One main canal takes off from the stone tub located infant of the bund towards northwest. Four branch canals emerge along the 4 km length of the main canal at different locations. Namely Varadi Kalva, Vuddi Kalava, Nennuru Kalava and Pootia Pallam Kalava. Each branch may irrigate directly a terminal of several individual fields. The villages receiving water from the canals are Balijapalli, Sanjeevarayapuram, Prasana Venkateswarapuram, Gangamabapuram, Gagireddipalli, Vallipuraim, Kamma Kandriga, Mitur, Garikachenupalli, Nadavaluru etc. One bamboo barricade and several diversion structures are there to control structures in the ayacut. The catchment area of the tank as follows:

- § A stream from Sangatimuddala Kona, North;
- § A stream from Ganuga Konda or Pillari Kona, South;
- § A stream from Gerigi Konda or gundu, North;
- § Theerta Kona Vanta west of Kalepalli;

- § Rakasivanka, west;
- § A stream from veera makula konda, South;
- § A stream from potti guttalu or Chemvumindara Kona;
- § Vepakuppam Vanka, West;
- § Sanna Vanka, West;
- § Pallapusenu Vanka, North;
- § Chukkabanda Varika, North;
- § Gokalapuram tank via Uppalu Vanka, West;
- § Three sprints from Pulluru Kona, North and
- § Peddavanka.

Water Distribution

At the beginning of each agricultural season – Kharif and Rabi – the water available in the tank is estimated. By means of observing the level of water in correspondence to the 4-5 such marks. The two weirs also act as marks. After assessing the quantity of water, the villagers decide which crops to be grown. When water is scarce, the tail-end villagers will not receive water available in the tank would be utilized by the head-reach village. Based on the mode of water allocation, the ayacut is divided into two regions. The head level villages (Balija Palli, Sanjeevaraya puram, and Prasanna Venkateswara puram) and tail-end villages (Gangireddi palli, Padmavathipuram, Guntha kamma palli, and Nadavaluru). A branch canal supplies each of the four upstream villages. Water is available continuously at a time for these entire villages. The farmers of these villages irrigate their field during the daytime. The area irrigated under these villagers is also small (200 acres). Most of the lands are irrigated directly from the branch canal. Once a field is irrigated, its next turn would come only after all the fields in the chalk-received water. Each field may receive water for every two or three days.

Demographic Features of Seven Villages in Rayalacheruvu Catchment area

Rayalacheruvu is supply water for agriculture to the seven villages where 13,480 people are living as per 2011 census. Out of total population 51 percent belongs to forward communities and remaining belongs to socially weaker sections of the society namely schedule caste, schedule tribes and backward caste as shown in the table 1.

**Table 1
Social Status of Population and their Literacy Rate as per 2011 Census**

Sl. No.	Name of the Revenue Village	SC	ST	BC	OC	Total Population	Literacy
1	2	3	4	5	6	7	8
1.	Gangireddy Palli	261 (21.9)	(0)	220 (18.5)	708 (59.5)	1189 (100)	472 (39.7)
2.	P.V. Puram	86 (8.0)	57 (5.3)	247 (23.0)	862 (80.4)	1072 (100)	374 (34.9)
3.	Sanjeevarayapuram	(0)	(0)	139 (38.1)	226 (61.9)	365 (100)	137 (37.5)
4.	Nadavalur	712 (24.9)	8 (0.3)	520 (18.2)	1621 (56.6)	2861 (100)	1387 (48.5)
5.	Chittatur-Kalepalli	766 (23.6)	49 (1.51)	1030 (31.7)	1402 (43.2)	3247 (100)	1161 (35.7)
6.	Rayalacheruvu	18 (2.1)	(0)	464 (54.5)	370 (43.4)	852 (100)	273 (32.0)
7.	Kuppambadur	954 (24.5)	58 (1.5)	1075 (27.6)	1807 (46.4)	3894 (100)	1517 (38.9)
	Total	2737 (20.3)	182 (1.35)	3945 (29.3)	6816 (50.6)	13480 (100)	5321 (39.5)

Source: Office of the MRO, Ramachandrapuram Mandal, Chittoor District.

The above Table reveals that under the Rayalacheruvu tank, it is quite surprising that upper caste farm holds are varies from 43% to 80% whereas BCs are in the range of 18% to 55% in seven villages. However, SCs and STs are concentrated in four villages only. Literacy is somewhat lower i.e., 40% with compared to district (42%) and Andhra Pradesh (45%).

It is identified that out of seven revenue villages, Nadavalur is ahead of district and state with 49% literacy rate. In fact this village is not totally depending on agriculture but many of the families are employed in Tirumala Tirupati Devasthanams (TTD).

Cultivators and Agricultural Labourers

Cultivators and agricultural labourers are playing an important

Table 2 Occupation Pattern in Rayalacheruvu Villages

Sl. No	Name of the Revenue Village	Cultivators	Agricultural labourers	Household industry	Other Non-agriculture	Total Population
1.	Gangireddy Palli	162 (13.6)	285 (23.9)	120 (10.0)	623 (52.4)	1189 (100)
2.	P.V. Puram	260 (24.2)	288 (26.8)	24 (2.2)	490 (45.7)	1072 (100)
3.	Sanjeevarayapuram	91 (24.9)	57 (15.6)	34 (9.3)	183 (50.1)	365 (100)
4.	Nadavalur	623 (21.8)	535 (18.7)	177 (6.2)	1526 (53.3)	2861 (100)
5.	Chittatur Kalepalli	100 (3.1)	667 (20.5)	320 (9.9)	2160 (66.5)	3247 (100)
6.	Rayalacheruvu	133 (15.6)	152 (17.8)	122 (14.3)	445 (52.2)	852 (100)
7.	Kuppambadur	115 (2.9)	941 (24.2)	199 (5.1)	2639 (67.8)	3894 (100)
	Total	1484(11.0)	2925 (21.7)	1006 (7.4)	8066 (59.8)	13480 (100)

Source: Office of the MRO, Ramachandrapuram Mandal, Chittoor District.

Rainfall in Ramachandrapuram Mandal

The average rainfall of the tank area is 943.5 mm. The tank receives the highest rainfall from Northwest monsoon especially in the month of November. The rainfall is not stable as shown in the table 3. Meteorologically it is found that the rainfall is 750 mm in a mandal it can be declared as drought prone area. If we examine the above table up to 1995, almost every alternative year this mandal declared as drought-prone one.

Table 3 Rainfall in Ramachandrapuram Mandal

Years	Average Rainfall in mm
2000-01	840.1
2001-02	754.3
2002-03	659.5
2003-04	478.9
2004-05	778.9
2005-06	658.0
2006-07	718.1
2007-08	540.0
2008-09	778.7
2009-10	338.5
2010-11	879.6
2011-12	539.0
2012-13	943.0

Source: Office of the MRO, Ramachandrapuram Mandal, Chittoor District.

Land Utilization

The net sown area under the tank ayacut is 3774 acres. Land put to agricultural use under the tank is 630.0 acres. The cultivable waste, and uncultivable lands area has been increasing. The irrigated and utilization under the tank has been declining. The Table 4 gives that P.V. Puram is the leading village in net sown area, succeeding Nadavaluru, Gangireddypalli, Rayalacheruvu and Kuppambadur, whereas the irrigating land under the tank is found more in Gangireddypalli and Nadavaluru. Because both are nearer to the head reach of the tank. However, in the net sown area, the irrigated area is significantly very low, i.e. 17%.

Table 4 Land Utilization under the tank (2000-01 – 2011-12) (acres)

Sl. No.	Name of the Revenue Village	Total Geographical area	Net Cultivable area	Net Area Irrigated
1.	Gangireddy Palli	765.38	352 (9.3)	144.38 (22.9)
2.	P.V. Puram	556.1	399 (10.6)	104.10 (16.5)
3.	Sanjeevarayapuram	481.89	244 (6.5)	58.89 (9.3)
4.	Nadavalur	1101.89	645 (17.1)	266.89 (42.4)

role in promotion of agriculture production in India. The table-5.2 explains about the cultivators and agricultural labourers under the Rayalacheruvu tank. In tank irrigated villages population accounts to 13480 of which 11% are cultivators and 21.7% are agricultural labourers. The house hold and other than household industry have less per cent whereas non-agricultural and other sectors consist of large per cent of population to the tune of 60%.

5.	Chittatur – Kalepalli	2557	958 (25.4)	20.10 (3.2)
6.	Rayalacheruvu	828.15	424 (11.2)	25.15 (4.0)
7.	Kuppambadur	1480	752 (19.9)	10.25 (1.6)
	Total	7770.76	3774 (100)	629.76 (100)

Source: Office of the MRO, Ramachandrapuram Mandal, Chittoor District.

Irrigated Area under The Tank

Irrigation is said to be life blood to agriculture. The area irrigated under different sources determines the yield rate of the crops. At present, the bore well technology and canal irrigation kicked out the good old tank irrigation system. The following table.5 shows the irrigating area under the tank.

Table 5 Irrigating area under the tank

Sl. No.	Name of the Rev. Village	1990 -1991	2000-2001	2010-11
1.	Gangireddy palli	150.45 (21.6)	144.38 (22.8)	75.45 (25.8)
2.	Prasanna Venkateswara Puram (P.V.Puram)	115.23 (16.6)	104.10 (16.8)	40.00 (13.7)
3.	Sanjeevarayapuram	62.32 (8.9)	58.89 (9.2)	25.00 (8.6)
4.	Nadavalur	290.78 (41.8)	266.89 (42.2)	125.00 (43.1)
5.	Chittatur-Kalepalli	32.15 (4.6)	20.10 (3.2)	7.50 (2.5)
6.	Rayalacheruvu	28.65 (4.1)	25.15 (4.0)	10.00 (3.4)
7.	Kuppam Badur	16.44 (2.4)	10.25 (1.5)	7.00 (2.4)
	Total	696.02 (100)	629.76 (100)	289.95 (100)

Source: Mandal Statistical Abstracts, Ramachandrapuram Mandal.

Table 5 denotes the pattern of irrigation under Rayalacheruvu Tank in between 1980-81 to 2000 – 2001. In 1980 – 81 nearly 700 acres were irrigated with tank water. It has decline to 630 acres by 1990 – 91 and further fallen to 290 acres due to shortage of rainfall in said years.

Cropping Pattern

Paddy is a staple food crop grown under the tank. Sugarcane is the main cash crop grown extensively under the tank. In the dry lands around tank a variety of rainfed crops are grown, including groundnut, pulses, chillies, coriander and so on. Mango is an important garden crop. Many of the dry and wetlands are being converted into mango gardens. Due to lack of labour two crops of paddy are grown. The first crop is largely rainfed and the other is tank fed. If water is still available a third crop is also grown. The important crops grown under the Rayalacheruvu tank and other irrigated areas are shown in the table.6.

Table 6 Cropping pattern of seven villages under the tank

S.No.	Crop	1980-81	1990 -1991	2000-2001
1	Paddy	482.40 (58.4)	317.50 (50.4)	165.50 (57.1)
2	Ragi	46.65 (5.6)	43.75 (6.9)	25.75 (8.9)
3	Groundnut	130.25 (15.7)	128.75 (20.4)	40.00 (13.8)
4	Sugarcane	113.65 (13.7)	92.00 (14.6)	33.00 (11.4)
5	Tomoto	12.12 (1.5)	15.00 (2.4)	6.70 (2.3)
6	Chillies	8.43 (1.0)	5.76 (0.9)	4.00 (1.4)
7	Pulses	13.00 (1.6)	10.00 (1.6)	5.00 (1.7)
8	Onions	8.00 (0.9)	6.00 (0.9)	5.00 (1.7)
9	Furits & Vegetable	5.00 (0.6)	6.00 (0.9)	2.00 (0.7)
10	Other Crops	7.00 (0.8)	5.00 (0.8)	3.00 (1.0)
	Total	826.50 (100)	629.76 (100)	289.95 (100)

Source: Office of the MRO, Ramachandrapuram Mandal, Chittoor District.

The table 6 shows that the ayacut area has been fluctuating year to year depending on rainfall. But the cropping pattern was almost similar. Under the Rayalacheruvu tank in each and every year 50 to 58 percent of land is used for paddy cultivation. The groundnut accounts the second place with 14 to 20 percent of area. The sugarcane is the third important crop

Table 7 Classification of Farmers Under The Tank (2000-01 to 2011-11)

Sl. No	Name of the Village	Large Farmers (>10 acres)	Medium Farmers (5-10 acres)	Small Farmers (2.5-5 acres)	Marginal Farmers (0.2.5 acres)	Total
1.	Gangiredi palli	3 (1.9)	10 (6.1)	50 (30.9)	99 (61.1)	162 (100)
2.	P.V.Puram	5 (1.9)	15 (5.8)	57 (21.9)	183 (70.3)	260 (100)
3.	Sanjeevarayapuram	0.0	15 (16.4)	30 (32.9)	46 (50.5)	91 (100)
4.	Nadavalur	7 (1.1)	25 (4.0)	168 (26.9)	423 (67.9)	623 (100)
5.	Chittattur-Kalepalli	6 (1.0)	20 (3.5)	200 (34.9)	347 (60.5)	573 (100)
6.	Rayalacheruvu	2 (1.5)	10 (7.5)	50 (37.6)	71 (53.4)	133 (100)
7.	Kuppam Badur	5 (0.7)	15 (2.0)	200 (27.3)	513 (69.9)	733 (100)
	Total	28 (1.1)	110 (4.3)	755 (29.3)	1682 (65.3)	2575 (100)

Source: Records of Panchyat secretary Chittattur – Kalepalli panchyat at Ramachandrapuram Mandal, Chittoor District.

They are large farmers, medium farmers, small farmers and marginal farmers. The marginal farmers are more in number as shown in the table-5.7. About 95% of the farmers under the tank are small and marginal. The rest of 5% consist of medium and large farmers. Large and medium farmers do not depend on tank water for their entire crops. They have substitute sources of water like wells and bore wells.

Caste Configuration

By all means India is a caste-stratified society. Occupations are classified by the time honoured division of labour. On the eve of Golden Jubilee Celebration of India, it is found that caste polarization is taking place at first in urban and penetrating in rural. The table-5.8 gives details about the caste configuration among landed farmers. The table-5.8 reveals that 64% of land owned by upper caste category. The rest of the land is concentrated among BCs. However, due to irrigation component 53% of farmers were found in marginal class.

Table 8 Castes in the Sample

Caste	Large Farmers	Small Farmers	Marginal Farmers	Total
O.C	7	32	40	79 (64.4)
B.C	-	14	16	30 (24.4)
S.C	-	5	6	11 (8.9)
S.T	-	-	3	3 (2.2)
Total	7 (6.7)	51 (26.7)	65 (53.3)	123 (100)

Source: Field Survey.

grow under the tank with well irrigation as well as tank water. The other crops i.e., Tommotos, Chillies, Vegetables are grown mostly for household consumption which accounts to one and below 1% of total crops.

Land Ownership

List of land owners along with size of holdings in the command area for both the period, i.e., 1947 and 1980 was prepared from revenue records called chitta and adangal. Land transfer cases/numbering 207 of a total number of 1104 land holdings as listed in 1947 revenue records were studied in four out of five villages. It is evident from the results of the survey that the number of landowners of the command area in seven villages has increased from 1104 in 1947 to 1491 in 1980 and 1600 in 2001. The increase in the total extent of land was registered to the extent of 500 acres in the recent years, as follows and dry lands got the benefit of irrigation. The average size of holding as the whole decreased from 1.42 acres in 1947 to 1.39 acres in 1980 inspite of increased acreage added to the total land area owned in his command area. It is calculated from 1947 data that about 82% of the landowners possessed 48.64% of the total land while 18% of the farmers owned 51.36% of the land in the command area. From 1980 data, it is calculated that about 74% of the land owners possessed 44.68% of the total land and the remaining 26% of land owners possessed 55.32%. Information and data were collected from landowners as well as village officials through personnel interviews with the help of pre-tested structured schedules for this purpose. It is found that there are four categories of farmers under the tank given in the table 7.

Utilization of Tank Water

Regular and right monsoons are the healthy indicators for the agricultural development in the year. Good monsoons will bring better yields to the farming community. Generally irrigated tanks are also depending upon monsoons. Fortunately, the reference year of 1980-81 to 2000-01 is considered as better monsoons. The table.9 presents a bird-eye-view of water utilization.

Table 9 Utilisation of Tank Water (2000-01 to 2010-11)

Sl.No.	Type of Farmers	Full	Partial	Total
1	Marginal Farmers	24 (55.8)	60 (75.0)	84 (68.3)
2	Small Farmers	18 (41.8)	19 (23.7)	37 (30.1)
3	Large Farmers	1 (2.3)	1 (0.012)	2 (1.6)
4	Total	43 (100) (34.9)	80 (100) (1.2)	123 (100)

Source: Field Survey

The table 9 stresses that 35% of farmers utilized the irrigating water in full. This shows that the farmers are not exploiting water resources optimally, probably either by not filling the tank or mismanagement of water.

Disputes on Misdistribution of Water

Irrigation is considered as an insurer of production. Lack of scientific awareness many of the farmers had a view that more

water, more yield will come. Many agricultural scientists dispute this. Rationalisation of water on one side and the capacity of plant absorption of water is taken as a measure to supply water. The table 10 emphasises the distribution aspects of water.

Table 10 Disputes on Mal-Distribution of Water

Sl. No.	Type of Farmers	Excessive Users	Low Users	Total
1	Marginal Farmers	40 (65.5)	44 (70.9)	84 (68.3)
2	Small Farmers	20 (32.7)	17 (27.4)	37 (30.1)
3	Large Farmers	1 (1.6)	1 (1.6)	2 (1.6)
4	Total	61 (100) (49.5)	62 (100) (50.4)	123 (100)

Source: Field Data

The table 10 brings out that 50% of farmers' especially marginal and small farmers are excessive users for their crops. Generally large farmers are taking own share of water in canals.

Distribution of Water

Equal distribution of water to all ayacutdars is considered as a basic ethical ideology of water resource. But many of the farmers with all their might and cunningness take more water for their crops. In this water gamble the weak farmers will loose their victory. The table-5.11 presents the distributors of water.

Table-5.11: Distribution of Water

Sl.No.	Type of Farmers	Equal	Unequal	Total
1	Marginal Farmers	36 (70.6)	48 (66.6)	84 (68.3)
2	Small Farmers	14 (27.4)	23 (31.9)	37 (30.1)
3	Large Farmers	1 (1.9)	1 (1.4)	2 (1.6)
4	Total	51 (100) (41.4)	72 (100) (58.5)	123 (100)

Source: Field Data

The farmers expressed their opinion about the distribution of water among different land holdings. The 59% of farmers including large and medium farmers complained that they are not getting equal share of water. But 41% of farmers expressed their satisfaction with regarding to equal sharing of water.

Irrigation Potential of Tank

Earlier it observed that have sufficient water to irrigate 1500 acres under the tank. But gradually irrigation potential of tank has decreased due to bore wells in nearby areas which such tank water. Bore wells are dug to irrigate dry lands around the tank. The table12 make it clear that 50% of farmers expressed that the tank is slowly losing its reservoir capacity on one side due to silt formation. Further, it is observed that farmers are not coming forward to remove silt voluntarily or remaking the channels for efficient supply of water on other side the duration of water storage decreased due to seepage of water into bore wells. Ultimately the lands under tank are getting water comparatively fewer days due to silk formation, bore wells. This gloomy picture proves that sustainability of tank is doubtful in future.

Table 12 Irrigation Potential of Tank

Sl.No.	Type of Farmers	Optimists	Pessimists	Total
1	Marginal Farmers	38 (62.3)	46 (74.2)	84 (68.3)
2	Small Farmers	22 (36.1)	15 (24.2)	37 (30.1)
3	Large Farmers	1 (1.6)	1 (1.6)	2 (1.6)
4	Total	61 (100) (49.5)	62 (100) (50.4)	123 (100)

Source: Field Data.

CONCLUSION

Small water reservoirs behind earthen dams are called "irrigation tanks" in India. Tanks are providing surface irrigation, recharging ground water and serving water needs of rural households and livestock. Tank irrigation is an old established practice in most of the semi-arid tropical parts of India, where the monsoon rains disperse erratically during a few months of the year and irrigation tanks serve to store and regulate the flow of water for agriculture use. South India has a long history of rain water harvesting through tanks and weirs. Andhra Pradesh, Karnataka and Tamil Nadu account for nearly 60 per cent of the tanks irrigated area. There are about 1, 27,000 tanks in these states as against 2, 08,000 tanks in the country. Although several reasons like deforestation, centralization of authority, poor catchment treatment, issue of private property, increase in population, agricultural transformation, unfavorable institutional framework and its capacity to handle the tank, etc. are quite evident from the field research and the available literature that the tank systems are on declining trend in terms of performance.

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