

Full Length Research Paper

Participatory Management of Rural Tanks and Transforming Coastal Region in Mandapam Block, Tamilnadu

M.Muruganathan¹ and Dr. P. Balamurugan²

¹Ph.D. Research Scholar, Centre for Rural Development, Annamalai University, Annamalainagar- 608002, Tamilnadu, India.

²Associate Professor and Director, Centre for Rural Development, Annamalai University, Annamalainagar- 608002, Tamilnadu, India.

Contact No: 9486527638

Email: drbalamurugnarasi@gmail.com

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Rural tanks are an important and smallest water bodies constructed by our forefathers, for the purpose of irrigation, domestic use, fisheries, ground water recharge, and shelter for birds, social forestry, flood regulation and drought mitigation. In India, there exist 2, 08,000 rural tanks, among which, most of them are located in the southern parts of the country. Rural tanks have brought out the benefits to their dependents, who are the farmers, villagers for their farm and home based activities. Almost all the rural tanks have been reduced and decayed, due to various reasons of individual and community factors, such as severe encroachment, unauthorized cultivation, heavy silt, weed and improper maintenance as well as the natural calamities. This has been resulted into reduction of water storage capacity, insufficient water supply that leads to crop failure. There are wide relationship between the greenery and conservation of natural resources at coastal region and assistance from the rural tanks will enrich the sustainable rural development. At this juncture, the present paper is aimed to highlight the participatory management of the rural tanks and its role in the greening coastal region of Mandapam block, Ramanathapuram district, Tamilnadu. It is therefore concluded that rural tanks profusely delivers the benefits to the tank villages that leads to securing livelihoods of village mass in the coastal region.

Keywords: Rural Tanks- Participatory Management- Greening Coastal Region-Irrigation- Live stock Maintenance- Sustainable Rural Development

1. Introduction

In developing countries like India, irrigation is one of the important components in agricultural development in specific and economic development in general. But a successful irrigation is only possible through effective participation of water users and an urgent attention is required to improve the quality of water management through water users (farmers) participation and equitable water-pricing arrangements,

to ensure reliability and adequate maintenance of irrigation systems. People's participation is viewed as a dynamic group process in which all members of a group contribute to the attainment of common objectives, share the benefits accruing. Rural tanks are complex human-made ecosystems involving many natural resources and providing a wide variety of functions. The different ecological, social, and

economic elements involved in the ecosystem are closely related and dependent on the existence of the water tank. Rural tanks are the basic of the livelihood of rural poor and also their technological system are the useful mode to conserve the rainwater towards store and save the water resources for the future generations. The central presence of the tank gives the essential structure and very important feature of geography of South India. It is characterized by the presence of a large number of tanks, making rural tank ecosystems. Historically, the main function of the rural tanks was to store and distribute water for irrigation purposes, but rural tanks provide many resources other than water for irrigation. They also entail realm uses and functions other than those related to agriculture, animal husbandry and other activities pertaining to sustainable livelihoods in villages.

At this juncture an attempt has been made to investigate managing rural tanks and their resource properties in a participatory manner, with a view of sustainable rural development. Few important studies have been conducted in the same field management of rural tanks by its water users. They are as follows:

According to Suba (2014) concluded that renovation of tanks for poverty reduction in leading to the sustainable livelihoods. Therefore, it is proved, beyond doubt, from this study, that there is a strong link between the success of renovation of rural tanks, poverty reduction and sustainable rural livelihoods. In addition to this renovation rural tanks has brought out the development of not only agriculture sectors, but also development of allied sectors. That determines the livelihood security in tank based villages. Bhuvanewari (2017) has found that tank irrigation development activities have significant impact on groundwater recharge, access to groundwater and hence the expansion in irrigated area. It is noted that vast quantity of run-off water going into the sea every year, efforts are needed to arrest and harness the runoff through the existing tanks in addition to linking of the tanks to the canal system wherever possible. Suggestions have been made for integrating the mechanisms or authorities to manage the entire cascade of tanks and lands irrigated under one administrative unit and creating direct accountability for performance. Balamurugan (2016) advocated that rural tanks have played several important roles in maintaining ecological harmony as flood control system, preventing soil erosion and wastage of run-off during periods of heavy rainfall, and recharging the ground water in the surrounding areas. They supply many villages with drinking water but their primary purpose is irrigation, especially of paddy fields. Feed wells by percolation and they fertilize the surrounding area and encourage the vegetation. Rural tanks after their modernization bring betterment in villages, through various advantages of the water for all living

beings, crop cultivation leads to more food production, sustainable natural vegetation and ground water recharge.

Another study by Ragupathy (2011) disclosed that the sustainable development in the villages has been only possible through effective participation in the development of rural tanks with the help of panchayat raj institutions. Devalatha and Ambujam (2011) concluded through their study that integration of the water users of rural tank system is very much important for achieving long term sustainability of agriculture productivity and livelihood improvement in underdeveloped area. Babu and Manasi (2009) argued that the participation of the farmers was essential for optimum utilisation of the benefits from the tanks that provide an opportunity for sustainable rural development. Hence it is identified that participatory management of rural tanks is the need of the hour, which is the only way for solving the present water crisis and help sustainable rural development.

2. Objectives of the Study

Based on the facts stated above, the present study is aimed to highlight the significance of rural tanks, people's participation and sustainable rural development. The objectives of the present study are

- 2.1. To assess the present status of rural tanks in the study area.
- 2.2. To evaluate the issues related to participatory management of rural tanks.
- 2.3. To trace out the importance of participatory management of rural tanks in different regions;
- 2.4. To suggest certain policy measures in promoting modernization of existing water bodies.

3. Methodology, Study Area and Sampling Design

The present study is mainly focused on the importance of rural tanks' for greening coastal region, which was conducted on the basis of both primary and secondary data related to coastal area of Mandapam block, Ramanathapuram district, Tamilnadu. Two rural tanks of Thamaraiikulam (Village-A) and Peruparai (Village-B) villages have been taken for present research. Both tanks are the important source to drinking water purpose and irrigate very meager crop land of 638.50 acre, Therefore, these two rural tanks are the supplementary irrigation sources to the crop land in the area. The total population depends on these two tanks are 4350, who are the residents residing around the select two tanks. Among which, the water users numbered 160 have been selected as a sample size for the present investigation on non-probable simple random sampling. The total sample of the study has been distributed equally to the two study tanks and their villages. (Table 1).

Table 1: Population and Irrigated Area under Rural Tanks and Sample Size

Rural Tanks	Population Covered	Sample Size
Tank-A	2450	080
Tank-B	1900	080
Total	4350	160

Source : Record of Block Development Office, Mandapam, – 2019.

4. Present Status of Rural Tanks

At presently, India has water management traditions through various water saving mechanism and water harvesting structures. It is obviously noted that local level water bodies like rural tanks are natural system of water storage and proper utilization of water in rural area. In India, there are 2,08,000 tanks are situated spreading throughout the country, which irrigates 28% of total irrigated area. Earlier, 41% of irrigated area was the total command area of the entire rural tanks in India during 1961-62 and they have been reduced in to 32% during 1981-82. Totally 60% to 80% of rural tanks are disrepair and decay due to the prime reason of severe encroachment (Thilagavathi 2016) and all other reasons of heavy siltation and improper management of the properties of rural tanks. The recent initiative of the government of Tamilnadu is Kudimaramathu scheme, which consists of traditional type of community participatory maintenance by its users, which resulted in the improvements in the development of rural tanks' traditions in Taminadu. and their capacities. This has been inevitably modernized 8, 868 tanks have been taken over for its renovation and revival during 2019-20, with a total cost of 1829 Cr. So that the net irrigated area of this achievements have been increased 34.5% and the

water table level has also been increased from 06.12% to 12.80% in almost all area in the state.

5. Issues related to participatory management of the rural tanks

At present, the gifts of nature viz., rural tanks have become reduction and retrenchment. They were neglected and given importance to major irrigation systems, which resulted in reduction in crop lands under cultivation. Several issues of inundated silting, accumulated weeding, severe encroachment, inadequate and irregular water supply, damaged supply and feeder channels, brokened bunds and absence of farmers' organisations are the major causes for steady decline of rural tanks, over a period. It has resulted severely in the reducing irrigated area of rural tanks, while there has been increasing status of irrigated area by canals and modern irrigation methods. The share of tank irrigated area in India declined from 14.60 percent in 1990-1 to 5.08 percent in 2015-2016, whereas the share of tube well irrigation increased from 30.17 percent to 55.36 percent during the above period.. In addition, the achievements of agriculture and allied activities by the energetic and result oriented farmers live in and around the rural tanks have been totally disturbed.

Table 2: Several Issues related to Rural Tanks

Sl. No.	Problems	Rural Tanks	
		Tank-A (80)	Tank-B (80)
1.	Inundated Silting	62 (77.0)	44(55.0)
2.	Accumulated Weeding	31(38.60)	39(48.3)
3.	Severe Encroachment	24(30.0)	23(28.3)
4.	Inadequate and Irregular Water Supply	39(48.3)	25(31.6)
5.	Damaged Supply and Feeder Channels	37(46.6)	29(36.6)
6.	Brokened Bunds Absence of Farmers' Organisations	44(55.0)	48(60.0)
7.	Absence of Farmers' Organisations	55 (68.75)	61 (76.25)
8.	Brokened Bunds	61 (76.25)	60 (80.0)

Source: Computed from Field Data. Note: Figures in parenthesis

It is noted that the respondents from the two select villages recorded their opinion on the issues related to rural tanks as indicated in table 4. Through this simple percentage analysis, it is found that the majority respondents stated that the issues like broken tank bunds is the major problem, followed 76.25 percent of the respondents indicate the problem of the absence of farmers' organizations. To compare to one village to another, it is the problem of inundated silting within the rural tanks is the main issue mentioned by 77 percent of respondents from Village-A, which is much higher than the respondents from the Village- B for the same issue represented 55%, However, in the both of the tanks' villages, the least percent of the tank users represented for the issue of severe encroachment on the tanks (30%). It is therefore notified that the almost all the respondents in both villages represented that the issues related to rural tanks is damaged tank bunds (80%), followed by heavy silting (77%) and absence of farmers' (users) Organisations (76.25%).

6. Importance of Participatory Management of Rural Tank in Coastal Regions

The tank system help to collect, conserve and store the little rainfall the region receives. In the process they reduce soil erosion by restricting the momentum of run-off waters. According to Raju (2000),

rural tanks provide low-cost flow irrigation; help recharge groundwater aquifers which provide a stable and reliable source of irrigation and domestic water supply as well for livestock. Rural tank and aquifer storage together provide protection against the vagaries of rainfall. In a year of high rainfall, such as the 1996 monsoon, tanks significantly reduced the threat and damage of flash floods. In contrast, in years of lower than normal rainfall, tanks and aquifer storage directly fed by tanks provide some protective irrigation. Palanisami. K (2012) disclosed that rural tanks are primarily meant for inland fresh water aquaculture, they have also been used for multiple purposes like irrigated agriculture, livestock and other domestic uses. Tank irrigation has thus a rich heritage on account of long historical antecedents in various regions of India. Over centuries, tanks and ponds constituted an important supplementary source of water to the distressed poor. Rural tanks are the centre of socio economic activities of a village catering to the multifarious needs of the village community.



Severe encroachments of Thamaraikulam Village Tank

The importance of rural tanks are presented in the table 2, in which the importance is listed as irrigation, livestock maintenance, drinking water, flood control, personal health and sanitation, ground water recharge and religious purpose. Among which, irrigation as well

as livestock maintenance is the main use of the rural tanks as opined by 98.30 percent of the respondents in the tank villages- A and 88.30 percent in the village - B.

Table 3: Importance of Participatory Management of Rural Tank in Coastal Regions

Sl. No.	Uses of Rural Tanks	Rural Tanks	
		Tank-A (80)	Tank-B (80)
1.	Irrigation and Livestock Maintenance	77 (96.60)	70 (88.30)
2.	Drinking water	42 (53.30)	53 (66.60)
3.	Flood control	65 (81.60)	72 (90.90)
4.	Personal Health and Sanitation	62 (78.30)	56 (70.00)
5.	Ground Water Recharge	68 (86.00)	78 (97.20)
6.	Religious Purpose	48 (60.0)	55 (68.75)

Source: Computed from Field Data. Note: Figures in parenthesis represents to the total.

Followed by it, the respondents of Village- A (86.00 percent) represented the importance of rural tanks in the greening coastal region is ground water recharge as the main importance and 97.20% of the respondents in Village - B observed that their tanks are mainly used for the purpose of ground water recharge. The flood control is the important activities as indicated by 81.60 percent of the respondents in village- A, which is much less than the respondents in village-B (90.90 percent). It is therefore found that the first and foremost importance of rural tanks is irrigation and livestock maintenance, followed by ground water recharge and flood control.

7. Major Findings

The rural tanks are very important community assets in villages, which significantly contributed many benefits to the village mass for securing livelihoods. It is proved that from the above analysis, the present status of the rural tanks in Tamilnadu state has been increased with dedicated services rendered by government of Tamilnadu by "Kudimaramathu" Scheme. There is drastic increase water capacity of different major rural tanks which provides sufficient water supply to crop production and majority of the rural tanks have been renovated in the state, particularly in Mandapam block, all 16 major rural tanks have been renovated. It is resulted in changes in crop production and ground water table level increased. The present study shows that the issues related to rural tanks is damaged tank bunds, heavy silting and absence of farmers' (users) Organizations are very important issues related to rural tanks. These are major issues of rural tanks in Tamilnadu, which are main hurdles and reasons for declension of rural tanks' performance in Tamilnadu. The importance of the rural tanks in coastal region is also featured through this present investigation and it has found that rural tanks provide better irrigation and water supply to livestock

maintenance, followed by the tanks help ground water recharge and flood control.

8. Suggestions and Conclusion

There is an urgent need renovation of all the rural tanks and the need is related to management based renovation, which should be focused on the reduction in technical/physical problems that would regenerate the systems of rural tanks. Rural tanks can be modernized that should be de-silting, de-weeding, rebuilding tank bunds and reorganizing the Tank Water Users'/Farmers' association. Thus, rural tanks support sustainable development in villages by water supply and maintaining sustainable eco-environmental system in villages. Participation of water users of rural tanks in coastal regions would be immensely useful to promote water capacity in villages. Hence, it is concluded that there is no doubt, beyond the majority of the rural tanks are having few physical and technological constraints and they profusely delivers the benefits to the tank villages that leads to securing livelihoods of village mass in the coastal region.

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