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Consequences of encroachment in tank irrigation system -case study

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Abstract : This study was designed to find out the consequences of encroachment in tank irrigation system. The study was conducted in Theni district of Tamil Nadu. Based on the existing problem of encroachment, Karuvelankulam tank of Bodinayakkanur taluk was selected as a case for conducting the study. The data were collected with the help of PRA techniques like group discussion and consequences diagram and case study approach. The study revealed that both positive and negative consequences had occurred in the society and agriculture due to encroachment in tank irrigation system. Finally farmers suggestion to evict the encroachment in tank irrigation system has been documented.

Key words : Tank irrigation system, encroachment and consequences.

Introduction

Irrigation has historically played a very important role in India's agriculture. Tanks play a dominant role in irrigation in the Indian states like Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu and Uttar Pradesh where tank irrigation accounts for an appreciable area. There were 39,202 tanks irrigating 928,000 ha of land, which was as much as one-third of the net irrigated area in Tamil Nadu. These tank systems vary in size from small ones irrigating 10 ha to large ones feeding 5,000 ha. (Venkataswamy, 1994).

Encroachment of tank was observed in different parts namely supply channel, catchment area, foreshore area, tank bed *etc.* Due to the encroachment of the lands, water filling in the tank gets decreased which eventually deters the availability of water to the farmers, dwelling alongside the command area. Apart from this the encroachers in the foreshore area break open the tank bunds thus avoiding the water to fill at full tank level. These facts remained as the cause for the social conflicts between encroachers and farmers in the tank command (Palanisami *et al.*, 2001).

Ramakrishnan (2000) reported that formation of sand dunes and encroachments by individuals had almost kept tanks at bay. Some of the tanks had shrunken as a result of encroachment. The present estimate of loss caused to India as a result of encroachment and other factors was put at Rs. 5000 crores.

Encroachment had direct influence over the tank performance. To improve the performance of tanks eviction of encroachment should be thought of seriously. In this context, studying the consequences of encroachment is important. Hence the present study has been designed to find out the consequences of encroachment and provide suggestion to evict the encroachment.

Materials and Methods

This study was conducted in Theni district of Tamil Nadu. Karuvelankulam tank of Kulaiyanur village in Bodinayakkanur taluk was selected as a case for conducting the case study on encroachment in tank irrigation system based on the tank which had the problem of encroachment and which was depended upon by farmer, solely for irrigating their crops. For studying the perception of command area farmers towards the consequences of encroachment in tank irrigation system, 24 farmers were selected randomly from the ends of the tank *viz.,* Head, Middle and Tail. Hence a total of 72 farmers comprised the sample size of farmers for the study. Semi structured interview schedule was developed to enhance the validity and reliability of the information, PRA techniques such as Group discussion and Consequences diagram were used. Percentage analysis was used for making simple comparison.

Results and Discussion

Karuvelankulam tank

The Karuvelankulam tank is located in Kulaiyanoor village of Uthamapalayam revenue division, Bodinaickanur taluk, Bodinaickanur block and Kulaiyanoor panchayat. It is a system tank which received water from the Kottoor dam. The tank also received water from 'Mullingasamy odai' which was divided into three streams namely Ellodai, Muthuirrulappa Pillai odai and Ramar odai. The length of the tank bund is 875 m. The registered ayacut of the tank is 99 ac. There were two sluices in the tank known as 'Chinnamadai' and 'Periyamadai'. Of the 99 ac, Chinnamadai covered 35 ac and Periyamadai 64 ac of command area.

History of encroachment

During 1972, Mr.Mottaiyan started the encroachment in tank. Mr.Mottaiyan family basically landless who leased in by heirs the tank for cattle manure and green manure, as days rolled started to encroach the area. The adjacent land owners to the foreshore area started to extend their encroached area. The villagers next to these villages who owned agricultural land in these villages started to have an eye on those encroached area. Villagers who dug out silt, started cultivation in the same area of the tank. Before 1980, only crops like sorghum, cumbu, castor, water melon, cucurbits and trees like silk cotton and coconut were grown. But during 1980, Mr.Ponnangan (a farmer who had own land adjacent to tank system) started paddy cultivation using his well water influenced other farmers also to practice paddy cultivation. Farmers who cut the fodder grasses encroached the same land for their own purpose. Some farmers encroached very small area not for the purpose of cultivation but with a view of selling it to other large encroachers.

Encroacher's background

Out of 24 ac of total area of the tank, 22.65 ac was encroached by 25 persons. Among the 25 encroachers two encroachers occupied outside of the tank bund area for coconut cultivation. Others encroached the foreshore area and water spread area of the tank. Among those encroachers only one encroacher belonged to Scheduled Caste and others belonged to Thevar community. Thevar community was dominant in this village that leads to ultimate Thevar population over there. Among 25 encroachers, 7 were adjacent field owners, who had their 'patta' land near foreshore area of the tank, 10 were landless and others were farmers of the command area and garden and dry land of the same village.

Consequences of the encroachment

The consequences of encroachment in tank irrigation system as perceived by the command area farmers are presented in Table 1.

Consequences of encroachment in the society

Both positive and negative consequences had occurred in the society due to encroachment in the tank irrigation system were given below.

a) Positive consequences

It could be seen from Table 1 that 50 per cent of the command area farmers perceived that there was remarkable co-operation among the command area farmers for the formation of Tank Farmers Association to evict the encroachment. More than one-third (41.6%) of the farmers perceived the betterment of livelihood of encroachers and 34.7 per cent of the farmers perceived that Government got revenue through collection of assessment charges from encroachers. Encroachment in tank irrigation was done for agriculture, so there was better employment opportunity to agricultural labourers. This was perceived by 27.7 per cent of the command area farmers. The hygienic condition of the tank was maintained and it was attributed to the encroachment. This fact was perceived by 18 per cent of the command area farmers.

b) Negative consequences

There were conflicts among command area farmers and the encroachers because of encroachment in the tank. This was perceived by 95.8 per cent of the farmers. Fish culture was greatly affected due to the encroachment and was perceived by slightly higher than half (55.5%) of the command area farmers. Nearly half of the farmers (48.6%) perceived that due to encroachment, there was reduction in revenue from tank. Other consequences such as reduction in animal population due to decreased water storage and increased migration of people to cities or towns to earn their livelihood were perceived by 16.6 and 8.3 per cent respectively.

Consequences of encroachment on agriculture

a) Positive consequences

It would be observed from Table 1 that all the command area farmers perceived that there was seasonal and permanent cultivation in encroached land. Higher yield could be obtained from encroached land was perceived by 6.9 per cent of the command area farmers as one of the positive effect.

b) Negative consequences

The major negative consequence due to encroachment was reduction in the water spread area of the tank. It was perceived by all the command area farmers. Storage capacity of the tank was reduced and it was perceived by 69.4 per cent of the farmers. About 65 per cent of the farmers understood that due to encroachment crop yield was greatly reduced. More than half of the command area farmers (56.9%) perceived that due to encroachment in tank, command area of the tank was reduced. Half of the command area farmers (50%) perceived that encroachment of tank area resulted in negative consequences like problem in silt collection (i.e., encroachers prevented the silt collection), absence of rain water harvesting and tank filling.

Conventional cropping pattern was changed due to encroachment. This was perceived by 41.6 per cent of command area farmers. More than one-third (34.7%) of command area farmers perceived that cost of cultivation of paddy crop was increased due to the purchase of well water from well owners as well as due to crop failure in command area, as a result of the encroachment in the tank

Table 1. Consequences of encroachment in tank irrigation system

(n=72)

S.No.	Consequences of encroachment	No.*	%
I.	**CONSEQUENCES IN THE SOCIETY**		
a)	**Positive consequences**		
•	Socio-economic consequences		
i)	Co-operation of command area farmers for formation of Tank Farmers Association (TFA)	36	50.0
ii)	Betterment of livelihood of encroachers	30	41.6
iii)	Government get revenue through assessment	25	34.7
iv)	Employment opportunity to agricultural labourers	20	27.7
•	Ecological consequences		
i)	Maintain the hygienic condition of the tank	13	18.0
b)	**Negative consequences**		
•	Socio-economic consequences		
i)	Conflicts between encroachers and command area farmers	69	95.8
ii)	Less revenue from tank	35	48.6
iii)	Migration of people	6	8.3
•	Ecological consequences		
i)	Fish culture affected	40	55.5
ii)	Reduction in animal population	12	16.6
II.	**CONSEQUENCES ON AGRICULTURE**		
a)	**Positive consequences**		
•	Socio-economic consequences		
i)	Higher yield from encroached land	5	6.9
•	Ecological consequences		
i)	Seasonal and permanent cultivation in encroached land	72	100.0
b)	**Negative consequences**		
•	Socio-economic consequences		
i)	Reduction in water spread area of the tank	72	100.0
ii)	Reduction in storage capacity of the tank	50	69.4
iii)	Yield reduction in command area	47	65.2
iv)	Reduction in command area	41	56.9
v)	Problems in silt collection	36	50.0
vi)	No rain water harvesting	36	50.0
vii)	High cost of cultivation due to purchase of water	25	34.7
•	**Ecological consequences**		
i)	No tank filling	36	50.0
‘0	Changes in cropping pattern	30	41.6
iii)	Crop failure	25	34.7
iv)	Ground water depletion	15	20.8
v)	Flooding	15	20.8

Multiple response recorded

system. Slightly more than one-fifth of the command area farmers (20.8%) perceived that due to encroachment there were flooding in command area due to breakage of sluice by encroachers deliberately and depletion of ground water in the area.

The reason attributed that encroachers grabbed the tank water and irrigated their encroached land. As a result, command area farmers did not receive sufficient water. So at that point of time, conflicts occurred between command area farmers and encroachers. Again within encroachers, conflicts occurred for extending their encroached land. Encroachment was done for doing agriculture. So encroachers levelled their encroached land in tank bed and formed bund around their encroached land, because of this the water spread area of the tank got reduced. It caused the reduction of storage capacity of the tank.

Consequence Diagram

Due to encroachment in the tank system both positive and negative consequences were perceived by the command area farmers. The consequence diagram as prepared by the key informants and respondents is presented in Fig. 1.

Positive consequences

- Encroachment in tank system would induce the command area farmers to form the Tank Farmers Association (TFA) for eviction of encroachment. By the formation of TFA the cooperation among the command area farmers was increased. Through this way the encroachers in the tank system were evicted successfully.
- Encroachers were mostly landless agricultural labourers. They knew only farming and they got employed only a part of year. So their income was too low ranging from Rs. 10,000 to Rs. 15,000. By the way of encroachment, they got additional income of Rs.20,000 to Rs.40,000 for leading their life.
- Because of the cultivation of crops like paddy in the encroached area, it provided employment opportunities to agricultural labourers.
- All the encroachers in the tank paid assessment charges depending on their extent of encroachment. So, Government got additional revenue due to encroachment.

Negative consequences

- Due to the encroachment of the lands, by these, water filling in the tank gets decreased which eventually deters the availability of water to the farmers, dwelling alongside the command area. Apart from this the encroachers in the foreshore area break open the tank bunds thus avoiding the water to fill at full tank level. These facts remained as the cause for the social conflicts between encroachers and farmers in the tank command
- Due to encroachment in tank bed, farmers could not collect silt from the tank which had to be added to soil for improving soil fertility. Encroachers prevented the farmers to collect silt. So farmers had to make arrangements to collect silt from other tanks. This involved more cost which farmers cannot afford.
- Due to encroachment in the command area, first season paddy crop was only successful. During second season paddy crop, they got water up to half of the crop period. So nearly for 8 - 10

Table 2. Suggestions for eviction of encroachment

(n=72)

S.No.	Consequences of encroachment	No.*	%
1.	Properly survey the tank, placing boundary stones around the tank	72	100.00
2.	Impartial and bold leadership is a must for evicting the encroachment	65	90.27
3.	Villagers should have unity to evict the encroachers	55	76.36
4.	Government should bring the tank maintenance work under farmer's control	45	62.50
5.	Eviction should be done without any discrimination	43	59.72
6.	Farmers should realize the ill effects and take steps for evicting the encroachment legally.	15	20.83

* Multiple response recorded.

irrigations, they got water from well owners. Few farmers, brought well water from garden land to wet land through underground pipes, minimum 2 km distance at the rate of Rs.2 lakh. So cost of cultivation increased due to purchase of well water at the rate of Rs.lOOO/season. Because of exploitation of well water, there was depletion of ground water.

- Encroachment and less rainfall led to scarcity of water and they could not cultivate paddy even for one season. Since they got water only for half of the crop period, yield was low. So they changed cropping pattern and cultivated crops like sorghum, groundnut and cotton as rainfed crops.

- Feeder canal namely 'Ellodai' joins the tank near surplus weir. There was encroachment near surplus weir. Due to this, encroachers did not allow water from Ellodai into the tank as they wanted to protect their encroached land. So that water directly went to 'Suruli' river. So there was no water harvesting.

- During heavy downpour of rainfall and high water supply period, encroachers to safeguard their encroached land from submergence opened the sluices which resulted in flooding in the command area. As a result, crop cultivation was affected and yield was reduced.

Suggestions for eviction of encroachment

An attempt has been made to identify overall suggestions expressed by command area farmers of Karuvelankulam tank for eviction of encroachment. The results are presented in Table 2.

It is evident from Table 2 that majority of the command area farmers suggested proper surveying of the tank and fixing boundary stones around the tank (100%), impartial and bold leadership by capable person is a must

for evicting the encroachment (90.27%), villagers should have unity to evict the encroachers (76.36%), Government should hand over the tank under farmer's control (62.5%), eviction should be done without any discrimination (59.72%) and farmers should realize the ill effects and take steps for evicting the encroachment legally.

Conclusions

Tanks being a common property resource had uniformly suffered from encroachment problem to varying degrees in the State. Now- a-days, there is a need for strengthening the water harvesting structures. The stored water could be used for domestic and agricultural purposes. But almost all the tanks have been encroached for various purposes. Encroachment had direct influence over the tank performance.

To improve the performance of tanks, eviction of encroachment should be thought seriously by users and tank management authorities.

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