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TITLE: DECLINE OF TANK IRRIGATION INSTITUTIONS IN SOUTH INDIA - A CASE OF TAMIL NADU

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Abstract:

The tanks occupy vital role in the irrigation as well as local ecosystem in the semi-arid and regions of South India. Meanwhile, tank provides multiple uses like source of drinking water for uncountable rural and urban communities and livestock, fish culture, recharge of ground water, control of floods etc. However, after the independence the significant source of tank irrigation has drastically decreased due to several socio-economic and institutional factors, particularly the changes in land ownership pattern, caste, class configuration and importance given to canal systems and over exploitation of ground water. At the same time today there is alarm that these valuable and extensive resources are in a state of collapse, contributing to increased drought vulnerability in some of the poorest districts in the country. The main motivation of this paper is to examine the importance of tank irrigation in South India particularly in case of Tamil Nadu and tries to find out why tank irrigation failed in the reign and how to improve this precious irrigation system. The paper also makes an effort to recommend policy guideline measures to revive tank irrigation in south India. The study is based on a critical reading of tank irrigation literature and available secondary data.

DECLINE OF TANK IRRIGATION INSTITUTIONS IN SOUTH INDIA - A CASE OF TAMIL NADU

Full paper

Tank irrigation is one of the oldest and significant sources of irrigation in India and is particularly in south India (Palanisamy, 1998). Irrigation tanks accounted for more than one third of the area irrigated in the south Indian states on Tamil Nadu, Karnataka and Andhra Pradesh¹. The tanks occupy vital role in the irrigation as well as local ecosystem in the semi-arid and regions of South India. This tank provides multiple uses like source of drinking water for uncountable rural and urban communities and livestock, fish culture, recharge of ground water, control of floods etc (Gurunathan, 2006). The existing/functioning of tanks have been known to south India for several years old, the historical evidence suggests that tank construction was sponsored by kings, chiefs and land lords (Uma Shankari, 1991). It is the most important minor irrigation source of irrigation.

This system has a special significance to the marginal and small scale farmers depending on tank irrigation. Tanks in the Indian context inextricably linked to the socio-cultural aspects of rural life and have historically been an indispensable part of the village habitat, sustaining its socio-ecological balance (Sakthivadivel *et al*, 2004). Irrigation in India has had a history extending to millennia, Tamil nadu can proud of some of the oldest examples of irrigation works in the country (Guhan, 1984)

However the main source of tank irrigation has consistently declined since independence. This decline can be seen equally in the shape of decrease in the relative importance of tanks and other modes of irrigation. At the same time today there is alarm that these valuable and extensive resources are in a state of near collapse, contributing to increased drought vulnerability in some of the poorest districts in the country. This paper examine the importance of tank irrigation in South India particularly in Tamil Nadu and try to

¹ See for instance Narayanamoorthy: 2007, Abhishek Sharma: 2003, Balasubramaniayan: 2003, 2004, Rama Mohan: 2003, Vaidyanathan and Sivasubramaniyan: 2001, Palanisamy: 2000.

find out why tank irrigation failed in the reign and how to improve this precious irrigation system.

This paper is divided into five sections. Section 1 and 2 briefly discusses the importance of tank irrigation in South India in general and Tamil Nadu in particular. Section 3 briefly outlines the different causes of decline of tank irrigation. While section 4 analyses socio-cultural, religious and historical aspects of tank irrigation and finally section five makes concluding remarks and some policy suggestions for revamping tank irrigation.

1. Tank Irrigation in South India

Tanks are a common feature of the south Indian cultural landscape and many were built in the 18th and 19th centuries by kings, zamindars and even the British rulers. Tanks are one of the important and oldest sources of irrigation and though they are found in all parts of India (Palanisamy: 2000, Uma Shankari: 1991). The total number of irrigation tanks in India is estimated to be around 2, 08,000. Out of this, three South Indian states of Andhra Pradesh, Karnataka, Tamil Nadu have nearly 1,20,000, irrigating 1.8 million hectares of land (Sivasubramanian: 2006, Sakthivadivel et al: 2004, Vaidyanathan: 2001)

Table No. 1 Net Irrigated by Source in India and Three Southern States, 1960 - 2000

1	India	% of NIA	AP	% of NIA	TN	% of NIA	KN	% of NIA
	2	3	4	5	6	7	8	9
Source	1960-61 to 1964-65							
Canals	10791	42.3	1293	42.0	895	24.4	280	29.7
Tanks	4668	18.3	1261	41.0	926	37.6	365	38.7
Wells	7627	29.3	397	12.9	602	24.4	157	16.7
Others	2454	9.6	127	4.1	43	1.7	140	14.9
NIA	25540	100	3075	100.0	2466	100.0	942	100.0
NSA	135908	18.8	11322	27.2	6039	40.8	10354	9.1
Source	1981-82 to 1985-86							
Canals	16278	39.2	1783	49.1	840	33	657	41.5
Tanks	3392	8.2	909	25.0	690	27.1	300	19.0
Wells	19511	46.9	832	22.9	993	39.0	440	27.8
Others	2376	5.7	108	3	21	0.8	186	11.7
NIA	41557	100	3632	100	2544	100.0	1583	100
NSA	141591	29.4	10941	33.2	5666	44.9	10415	15.2
Source	1997-98 to 1999-2000							
Canals	17598	31.2	1602.0	37.3	847	28.4	950	38.5
Tanks	3114	5.5	675.0	15.7	666	22.4	247	10.0
Wells	32557	57.6	1824.0	42.5	1448	48.6	916	37.1
Others	3223	5.7	188.0	4.4	18	0.6	355	14.4
NIA	56491	100	4289.0	100	2979	100.0	2468	100.0
NSA	141971	39.8	10478.0	40.9	5560	53.6	10274	24.0

Notes. AP = Andhra Pradesh. TN = Tamil Nadu. KA = Karnataka. NSA* denotes as per cent of NSA.

Source: GOI, Indian Agricultural Statistics, Vols. I&II, 1992-93, New Delhi, CMIE, Agriculture, Feb 2004.

Table 1 shows the net irrigated area by different sources of irrigation in India and three southern states. It shows that the percentage of area under tanks declined gradually in All India level as well as in all three southern states during the period from 1960 to 2000. Meanwhile the well irrigation is increasing rapidly during same period (See figure 1, 2 and 3 also).

Figure 1 Decline of Tank Irrigation in Three Southern States

Figure 1

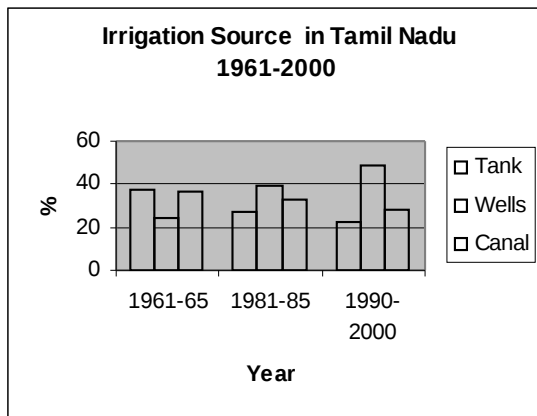


Figure 2

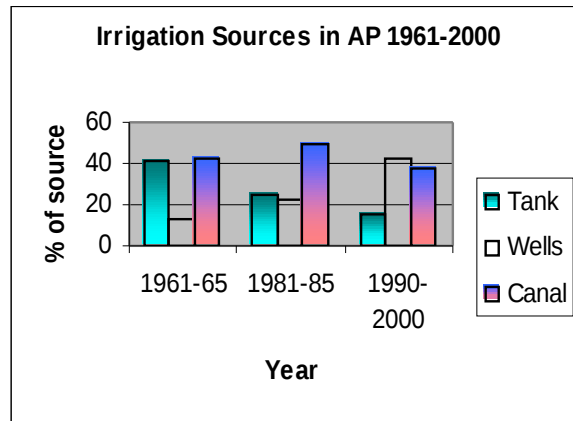
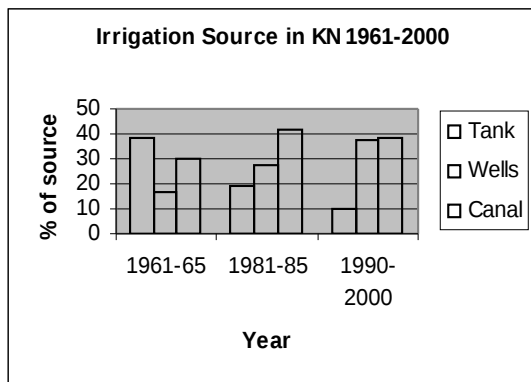


Figure 3



Source: GOI, Indian Agricultural Statistics, Vols. I&II, 1992-93, New Delhi, CMIE, Agriculture, Feb 2004.

The three figures indicated that the tank irrigation in three southern states like Tamil Nadu, Karnataka and Andhra Pradesh declined dramatically 1961 to 2000. At the same time the well irrigation increased.

2` Importance of Tank Irrigation in Tamil Nadu

History of Irrigation in Tamil Nadu highlights several important features of it. It is notable that certain variety of irrigated cultivation can be traced back as early as the sangam period (c. 300 BC – AD 300) Sangam literature mentions paddy cultivation both interims of river and tank irrigation (Bandopadhyay, 1992). An Irrigation tank small reservoir constructed the slop of a valley to catch and store water during rainy season and uses it for irrigation during dry season (Palanisamy, 1997). The tanks have always been important source of irrigation especially in southern India. Tamil Nadu is one of the states where tank irrigation potential in relatively high. Village tanks occupy a significant position on irrigation and in local ecosystem in the semi-arid and arid regions of Tamil Nadu, 1/3rd of gross cultivated are under it owned mostly by rural poor (Gurunathan, 2006). Sivasubramaniyan (2006) in his study found that tank irrigation is located widespread in South India where nearly 60 per cent of the area under tanks is located particularly in the state of Tamil Nadu, Andhra Pradesh and Karnataka. Different sources of irrigation (canals, tanks, wells and other sources), tanks are considered the prime source for the development of agriculture which indirectly helps the wells to get recharge it s supply. Before the independence the tank system is one of the major components of minor irrigation sources in many of the India states. Tanks have many positive attributes such as

- Less capital intensive to build and maintain
- Provide ecological benefits
- Recharging ground water
- Control the floods
- Provided livelihood options (farming, fishing, forestry, dug hearing)

Tamil Nadu is a water deficit state. The state's ultimate irrigation potential is low. The surface water sources have been exploited to this potential and there is very little scope for further development of major and medium schemes. The State's agricultural production mainly depends on the north east monsoon. None of the rivers in the state is perennial and

rarely half of the cropped area in the state continues to be rain fed. Quality in terms of assured, adequate and timely supply of water is crucial for increasing the productivity of land for ensuring food security. Water is the basic input for crop production. Intensive and extensive cultivation of land mainly depend on the availability of water. Important sources of irrigation in Tamil Nadu are Canals, Tanks and Wells.

Table 2: Different Source of Irrigation in Tamil Nadu

Source	1960-61	1970-71	1980-81	1990-91	1999-2000
Canals	35.80	33.90	32.70	32.40	27.58
Tanks	38.00	34.50	32.10	22.38	19.47
Wells	24.20	29.80	33.80	44.61	52.88
Others	2.00	1.80	1.40	0.61	0.37
All	100	100	100	100	100

Source: Tamil Nadu-an economic Appraisal (Various Issues)

Table 2 shows the different sources of irrigation in Tamil Nadu. It indicates that, there is declining of tank irrigation in Tamil Nadu. For example during 1960-61 the share of tank irrigation in Tamil Nadu is 38.00 per cent, but it declined to 19.47 in 2000. At the same time well irrigation is increasing 24.20 per cent to 52.88 per cent dramatically.

Management of Tanks

Tanks are classified into two categories i.e., system and non-system. The system tanks receive water from major streams or reservoir in addition to the run-of from their own catchments. Non-system tanks depend on rainfall and are not connected to a river system. Originally most tanks were non-system tanks.

Currently, for the administrative purpose tanks are classified into Panchayat Union (PU) and Public Works Department (PWD). Panchayat tanks have a command area less than 40 ha, and the control is with the village communities. PWD having a command area of more than 40 ha and all the system tanks are maintained by PWD. Tamil Nadu State is India irrigated an area of about 0.91 M.ha through 39,200 tanks, which accounts for 17 per cent of all tanks in the country (Jothi Praash, 2004).

3 Causes of Decline of Tank Irrigation

After the independence the significant source of tank irrigation drastically decreased due to several socio-economic and institutional factors, the most factors has been changes in land ownership pattern and changes in caste and class configuration (Sivasubramaniyan: 1997, Janakarajan : 1993, 2003, Sakthivadivel : 2004). The minor irrigation was decreased after independence due to importance given to canal systems and over exploitation of ground water (Sivasubramaniyan, 1998). The decline of tank irrigation due to particularly massive diffusion of private wells and pumps has spread to tank command area (Balasubramaniayan, 2003). Emergence of wells is influenced by many factors such as the advent of green revolution technology, the farmers were switched over to well irrigation due to its quality irrigation which provides more yield and more crop. Due to this change farmers are able to cultivate multiple crops in a year. So the cropping pattern was changed meanwhile the traditional irrigation system such as tanks got disintegrated. Materialization of wells in the tank ayacut has led to the decline of interest in the tank management among farmers who own wells at the same time well is a private resource whereas a tank is a common property, moreover well irrigation is more stable and reliable than tank irrigation (The Hindu Business Line, March 2002).

The IWMI–Tata Programme pointed out identify the characteristics of high performing local managed tank institutions which are able to adapt themselves to changes in water supply, ground water development, changes landholding pattern, and wider socio-economic changes such as changing landholding pattern, social structure, urbanisation and others (Sakthivadivel et al,2004) . The most important reasons of breakdown of tank irrigation are due to disappearance of village institutions that were managing the tanks (Asian Development Bank, 2006). Encroachment on the tank foreshore area, deforestation in the catchments area, poor operating condition of the upper sluices, defective tank structures, weak farmers organization also lead to decline of tank performance (Narayanamoorthy: 2007, Dhan Foundation: 2004, Palanisamy: 2000, Vaidyanathan: 2001, Sivasubramaniyan,1998)

4 Socio-Cultural, Religious and Historical Aspects of Tank Irrigation

In South India, the tradition of establishing a tank alongside a temple prevails. Since every village has a temple, it also has a temple tank. These tanks were constructed to harvest water. The temple tanks are known as *kovil kulam* in Tamilnadu, *kulam* in Kerala, *kalyani* in

Karnataka and *cheruvu* or *pushkarini* in Andhra Pradesh. The water from the temple tank was mainly meant for the ritual bath of the deity and to provide water for the flowering plants in the *nandavanam*. Devotees also washed their hands and feet or even bathed in a separate tank maintained for that purpose before entering the temple. The temple tank was the focal point of several religious activities like the *theppam* or float festival, for the offering of prayers to one's ancestors and meditation on the banks of the tank²

The temple tanks were the focus of all activity, and the water was used for the ritual bath of the deity (*abhishekham*) and for the bathing of the devotees. Festivals were held round the tanks and a *mandapam* situated in the center of the tanks would house the deity during the *theppam* or float festivals. In Tamilnadu, the temple tanks were once the heart of water management, and ensured riparian rights and sustainable use. But community care has long since vanished.

In ancient days, temple tanks were constructed to the east of every village, and multipurpose tanks to the west. Today, many are abused or in a state of disuse, their potential and original purpose all but forgotten. The problems due to poor maintenance, encroachment, lack of money etc.

A View of Temple Tank



5 Concluding remarks and Policy suggestions

² See in this context http://cpreec.org/04_phamplets/19_traditional_water/traditional_water.html

The important source of tank irrigation has been constantly decline due to other mode of irrigation, shortage of rainfall, lost of farmer interest, financial problem etc., and the traditional water management of tank irrigation largely disappeared due to modern technologies. Now the tank irrigation system is critical condition. Because farmers are more concerned about Ground water. With out surface water the ground water used for only limited period. The other factors of decline of tank irrigation are conflict among villagers, encroachment, siltation, poor maintenance etc. Except suitable finance, institutional arrangements, improve of user participation are evolved the present condition will continue.

The Government should take necessary action through Public Works Department, Forest Department, and Village Panchayats (watershed development, water harvesting, revival of small water bodies) to avoid growing water scarcity for agriculture, industry, domestic and drinking purposes.

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