

Vision for Village Tanks of Tamil Nadu



DHAN Foundation
India



Multiple Uses of Tanks

The sustainability and the long history of tanks are attributed to its multiple and diversified uses. The water and land space of the tank serves several sections of village communities.



The tank is a land mass available for grazing cattle and livestock by the villagers. Historically, the settled populations in the countryside used these spaces to grow trees which can provide shade fuel wood and fodder. Also the end of crop season communities get copious amount of Fish.



Most of the drinking and domestic water wells, ponds are located nearby the tanks and get water directly or else by recharges through it.



True to a wetland ecosystem the interactions between human, land and water are highest in tanks and provides highest productivity both in agriculture and ecosystem uses.

The famous and most important bird sanctuaries and scenic beauties of the state are in the tanks.

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Contents

1. Tanks of Tamil Nadu	1
2. The Purpose	5
3. Key Messages and Actions Required	8
4. The Problems	11
5. The Key Actors	23
6. What Needs to be Done?	29

Vision for Village Tanks

“These are the monuments of real Kings, who were the fathers of their people; testators to a posterity which they embraced as their own. These are the grand sepulchers built by ambition; but by the ambition of an insatiable benevolence, which, not contented with reigning in the dispensation of happiness during the contracted term of human life, had strained, with all the reachings and graspings of a vivacious mind, to extend the dominion of their bounty beyond the limits of nature, and to perpetuate themselves through generations, the guardians, the protectors, the nourishers of mankind”.

Edmund Burke, (1785) on minor irrigation tanks in South India.

DHAN Foundation, an organization dedicated to work for the farmers and disadvantaged communities is happy to present a collective vision generated through a stimulating exercise lasting for a period of a year through this document. It hopes the vision is achievable and beneficial to the present and future populations of the state.

A Vision is presented here of a state in which the benefits of tanks and related ecosystems of the people are optimized, while the tank institutions and systems are preserved. In the land of Tamils, the mutual dependence of villagers and tanks is accepted as a way of life, culture and source of bio-diversity in the village ecosystem.

This Vision describes a world in which conservation of environment is guaranteed, because every one values and accepts personal responsibilities to the village commons like tanks. The maintenance of tank systems is based on the integrated management of the command areas (wetlands), tank areas and network of channels cascading in every piece of land.

The state of Tamilnadu is also a world in which millions of farmers who are small and marginal are dependent upon the tank systems for their livelihood. The numerous benefits of tank ecosystems across the undulating topography of the state are so very vital for them in times to come and forever. Finally, it is a world where tank systems are used and managed in a fair and sustainable manner for economic security.

The Vision expressly calls for the development of tank ecosystems through all possible means with the help of the Government, Philanthropy, Farmers and all the Villagers concerned. A clarion call is made to all those concerned, to rectify and reverse the existing trends in the decay of tanks. It seeks fresh and concerted action without looking back to the consequences of acting swiftly on the errand in the social, political and governmental arena.

1. Tanks of Tamil Nadu

Tanks are earthen bunded reservoirs usually constructed to capture monsoon runoff in arid and semi arid areas. They are found in all soil types except sand, located in all socioecological, agroclimatic and rainfall areas of Tamilnadu. They are in existence for several centuries serving the water needs of communities.

As one of the oldest man-made ecosystems, the tank system consists of water bodies, tank structures, feeder canals and supply channels, wells, wetlands, semi dry tankfed lands, soils and plants, animals and birds, aquatic plants and fishes.

As an agricultural system tankfed agriculture is distinct in cropping practices, varieties and water management. As an engineering system it is historically one of the oldest in irrigation engineering design. As a management system it had institutions built around them.

As a social system the tank serves and benefits various sections of the village community such as farmers, fisher folk, artisans, animal rearers and especially women.

It is not an exaggeration to claim that the tanks are one of the still surviving, man-made and largest common property resource in Tamilnadu. They are eco-friendly, that is, a proper management of the system would itself ensure protection and preservation of the environment. They serve both as flood moderators in times of heavy rainfall and as drought mitigators in times of long dry spell.

Vision for Village Tanks of Tamil Nadu

Being widely dispersed, if revived to their original capacity, they would ensure direct irrigation and ground water recharge in rainfed areas. They are a basic life supporting system in most parts of the state.

Being numerous, small in size and spread over thousands of villages, they lend themselves to decentralized management. The irrigation services are far superior in terms of conveyance and water use efficiencies

Tanks are resource complexes for multifarious uses of the local communities. The most prominent uses include the following:

- Set the agenda for all the primary stakeholders, philanthropic organizations and the community.
- Irrigation, drinking water for people & animals, domestic use for people & animals and recharging ground water aquifers.
- Space for animal to graze, to grow fuelwood and timber, fodder, avail silt for manure and sand for construction.
- Sanctuary for birds, animals and bio-diversity complex for flora and fauna and place to rear fish.

There are not many tanks constructed in the recent past two hundred years however, the general parameters required for tank construction seems to be the following:

- Topography of the land mass such as slope, soil type etc.
- Uneven and inadequate rainfall occurring in short spans.
- Geological parameters such as hard rock or any hard earth.
- Availability of land space for tank construction and agriculture.
- Village as an institution to construct and manage the system.
- Dependent population on agriculture and livestock.

Even though, most of these parameters exist in many parts of the world, many communities struggle to get water for generations. However, the human efforts and scientific interventions have made the formation of tanks in such a vast number in Tamilnadu. This has remained a foundation for irrigated agriculture and a thriving agrarian economy for centuries.

Table - 1 Tanks in Tamil Nadu

Sl. No.	District	Number of Tanks	Area Irrigated by Tanks (ha)
1	Kancheepuram	1,942	82,645
2	Tiruvallur	1,686	35,490
3	Cuddalore	592	6,216
4	Villupuram	2,085	50,602
5	Vellore	1,355	20,272
6	Tiruvannamalai	1,965	34,187
7	Salem	546	3,672
8	Namakkal	259	2,850
9	Dharmapuri	2,347	16,475
10	Erode	52	307
11	Coimbatore	77	2,061
12	The Nilgiris	0	0
13	Tiruchirapalli	1,767	10,696
14	Karur	266	2,080
15	Perambalur	796	9,035
16	Pudukkottai	5,451	74,796
17	Thanjavur	428	7,913
18	Tiruvarur	0	0
19	Nagapattinam	0	0
20	Madurai	2,287	22,138
21	Theni	206	5,518
22	Dindigul	2,230	13,078
23	Ramanathapuram	1,694	56,906
24	Virudhunagar	997	24,933
25	Sivagangai	4,911	73,240
26	Tirunelveli	2,170	47,569
27	Toothukudi	634	14,200
28	Kanniyakumari	5,205	16,173
	State	41,948	6,33,052

Source: Season and Crop Report (2001), Department
Statistics and Economics, Chennai

Vision for Village Tanks of Tamil Nadu

Table - 2 Land and Water Resource of Tamil Nadu

Sl. No.	Classification	Total area (in '000 ha)	Percentage of the total area
1	Forests	2,133	16.4
2	Barren and uncultivable land	475	3.7
3	Land put to non agricultural use	1,978	15.2
4	Cultivable waste	348	2.7
5	Permanent pastures and other grazing lands	122	0
6	Land under miscellaneous tree crops and groves not included in net area sown	242	1.9
7	Current fallows	1,085	8.3
8	Other fallows lands	1,139	8.8
9	Net area sown	5,464	42.1
10	Total geographical area	12,998	100
11	Area sown more than once	1,054	8.1
12	Gross cropped area	6,519	50.2
13	Area under food crops	4,646	
14	Area under non-food crops	2,083	
15	Cropping Intensity	119.46	

Source: Season and Crop Report 1999 - 2000, Department of Statistics and Economics, Chennai

Table - 3 Irrigation in Tamil Nadu over five decades in '000 ha

Sl. No.	Particulars	1950 - 51	1960 - 61	1970 - 71	1980 - 81	1990 - 91	1996 - 97	1999 - 00
1	Tanks	565	936	898	590	531	624	633
2	Total net irrigated area	1,855	2,462	2,562	2,570	2,373	2,812	2,971
3	Gross area irrigated	2,189	3,235	3,410	3,294	2,894	3,183	3,582

Source: Season and Crop Report 1999 - 2000, Department of Statistics and Economics, Chennai

2. The Purpose

The concept of community management of water resources is gaining the recognition of governments, NGOs, philanthropic institutions and the farming community. Small-scale systems that are truly community managed are in existence for centuries in many parts of Asia. Among those surviving systems, tanks are one of the largest in terms of numbers. An estimated number of around 40,000 small and big structures had originally served close to a million hectares of paddy in Tamilnadu.

The changes brought in the recent past, had a crippling effect on the structures and communities which they served. The centralized administration introduced by the British colonial rule had almost wiped out the role of the community in conserving and developing them. Even in free and independent India it is continued to be even more retrogressive in keeping people and locals away in matters related to the tanks. Presently the tanks have many stakeholders such as the Irrigation department, the local Panchayats, the Revenue department, the Agricultural Department, Forest department and the local people. Of these, are the encroachers the most active and the user communities the most passive witnessing a colossal change.

These resources need revival and rehabilitation. The situation therefore calls for major changes in governance, and management, activism of the locals, research in engineering & tankfed agronomy, funding by the governments, and donors. The desired changes can be brought about only when the various stakeholders are brought to a common platform to share their views on the need for sustained management.

It is therefore decided to consolidate the experiences of the constituents dependent on tanks. Some attempts for reforming the system and administration were made by the various stakeholders like the farming community, government and non-government agencies, research and academic institutions. Such efforts were sporadic and did not culminate into any appreciable policy change. Therefore a series of the stakeholders' meets, discussion groups, future search meets and Farmers Conventions were organized to sharpen the understanding on tanks. DHAN Foundation across the state, representing various agro-climatic and sociological setting selected five basins to get a glimpse of transition in tanks and tankfed agriculture.

The objectives of this exercise was to

- Bring together the major actors involved in the theme, to evolve and shape the future of tanks.
- Set the agenda for all the primary stakeholders, philanthropic organizations and the community.

Stakeholders Meet

There are many stakeholders in the tank and tank programs, of which the government agencies, farmers and research institutions are important. The government officials, institutions and farmers were invited for the meet to listen to each one's views on the tank systems. The meet focussed on the Status of Tanks, Tankfed Agriculture, Tank Administration, Encroachment and the Improvements needed on these aspects.

Future Search Meet

The tank as a resource has got multiple uses and users. The Future Search Meet was to ascertain the perspectives of all the users of the tank and village. Representatives of the various users have debated on the subject of the tank. The agenda for discussion included - The past uses and users of tanks; Tank maintenance; Changes in Tank Productivity, Crops, Well Irrigation and Water Management before

and after independence; Reforms proposed for Administration, Usufructs and Water Management; Tank Rehabilitation and its need; present & future scope of developing tankfed agriculture.

Farmers Convention

A Convention of Farmers from 175 villages was organized to hold discussions. Nine preparatory meetings were also held with the participation of around 100 farmers from block towns and key villages. The discussions focussed on the topics like - the general status of tanks in the blocks; rehabilitation programs in the area; farmers participation in the programs; tank encroachments and tank productivity. DHAN Foundation staff organized such meetings.

The document captures the essence of all these proceedings done over a period of more than a year.

3. Key Messages and Actions Required

Decay of tanks and tank management

It is visible that large-scale damage are being done to tank systems in many parts of the state that needs immediate attention of one and all. The decay of tanks represents the typical death of a village ecosystem, starting from small damages of reversible nature, slowly heading towards an irreversible situation due to multiple and complicated reasons. The tank management systems which are directly related to the village social systems are breaking down across the state due to the social and socioeconomic changes happening in the villages which need to be addressed immediately. The decay of tank systems also portrays a general disorder and apathy in village - local administration and the breakdown of existing mechanisms at the lower levels of government across the districts.

Conservation and Development of Tanks

The tank systems have provided an insulation from dependence on rains to the people living in the fragile rainfed areas. The farmers in rainfed tanks who are predominantly marginal and small farmers are highly vulnerable to the vagaries of monsoon. The importance of tanks is being realized more and more, as the continued use of groundwater and other water resources is proving to be very costly and inadequate to meet their varying demands.

So the tank ecosystems have to be conserved to provide a safety net to the livelihood of these farmers. The conservation and development of

tanks have to be done considering the multiple uses of them. Such uses are irrigation, drinking and domestic water for people & animals, for recharging groundwater; fuelwood and timber, rearing fish, fodder, silt and sand; sanctuary for birds, animals and bio-diversity complex for flora and fauna.

Institution Building for Tanks and their Rehabilitation

The very survival and usefulness of the tanks are attributed to its technology and the institutions built around them. Over the centuries the social changes which were reflected in all walks of life had a bearing on the village tanks also.

The involvement of local people in planning and implementing the development works is very important and urgent in all programs. Therefore development programs should be taken up only with participatory plans built by the local institutions. The tank rehabilitation works need to be done only through the local Tank Farmers Institutions.

Clearance of Encroachments on Water Bodies

One of the major causes of decay of tanks in many parts of the state, is the encroachment of tank beds and feeder channels. The disincentives for the encroachers are quite insignificant, when compared with the revenue generated by them from the encroached area. Apart from this, the procedure and implementation required to clear of encroachments is cumbersome and time consuming as of now. The patronage from the local politicians and officialdom plays a crucial role in encouraging encroachers and perpetuating their deeds.

The possible remedy could be the transfer of tank management along with rights and authority to the local users groups which will help in controlling the menace in the long run. In the short term, the government should notify encroachments in water bodies as criminal offences and facilitate the local villagers to proceed against the encroachers through appropriate empowerment.

Focussing the investments

The special programs and area development programs like the Watershed development projects, Western Ghats Development Projects and Forest Development Projects may place importance on reviving / rehabilitating the existing water bodies like tanks, rather than creating new ones, considering their cost effectiveness. In many areas of the state several projects undertaken by Agricultural Engineering, Forestry, Agriculture and other departments have created many new structures, leaving alone the tanks in continued disrepair. The investment required for the revival of tanks is far less resulting in saving the government money. Therefore any project aimed at groundwater and watershed development in dryland areas should start with rehabilitation of the existing tank systems.

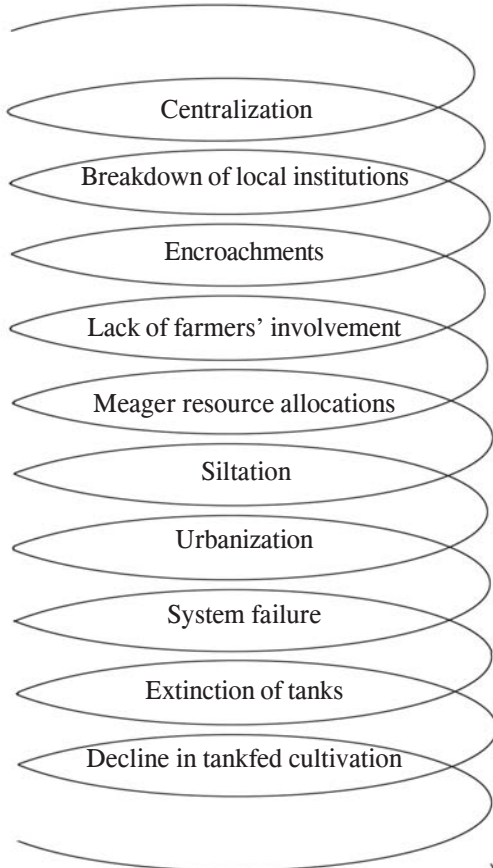
Involving Philanthropy

The history of water development is replete with numerous examples of philanthropic efforts in Tamil Nadu. However, in the last two centuries there were not much seen or heard about such efforts in water development. It is high time to invite the socially concerned individuals, the rich and wealthy, corporations to involve in conserving tanks and ponds. The noble values attached to provision of water for the needy should be highlighted. Their efforts in contributing funds for development of tanks and ponds will go a long way in continuing a sociocultural tradition.

4. The Problems

The poor status of tanks is attributed to several reasons of which the centralization of administration is one leading to the breakdown of village tanks. The spiral captures the entire scenario of the decline of tanks from all angles.

The Current Scenario of Downward Spiral



Absence of local management

Since the days of the British, there have been no formal governing mechanisms available for the tanks at the local level. The 'state' is the owner of the properties and tanks are vested with Public Works Departments and Panchayats for maintenance and management. However, most of the day-to-day operations are attended to, only by the local villagers and rarely by the government departments or Panchayats. The local management by the villagers in tanks is also undergoing severe stress due to the changes and breakdown of village social systems. With the gradual collapse of village unity, common meetings and other collective actions are on the decline. Because of such a decline the performance of tanks is coming down and the damages are on the rise.

Leaky sluices and damaged weirs

The tank sluices and weirs are simple masonry works. Most of them are old and need continuous maintenance. The present status of these structures across the state shows a picture of leaking sluices and damaged weirs. The normal damages caused due to the absence of local care have to be attended by the farmers. The damages on weirs are caused mainly by the encroachers on the tank beds, who are in a hurry to dispose of the storage to save their standing crops from submergence. The researches on water management estimate the loss of water due to the leaking sluices as one third of the storage.

Encroachments on Tanks

Encroachment is an illegal and unauthorized occupation of tanks. Tanks are becoming the easiest prey for land grabbing, for various uses. Almost every tank has a story about encroachments by different sections. The encroachments happen mostly in feeder channels, tank bunds and waterspread areas. The encroachers can be broadly categorized into two : private and public. The farmers, general public and others do the private encroachments mostly for economic reasons

Box - 1 Encroachments - a curse on tanks

Theriruvveli tank in Mudukulathur block of Ramanathapuram district is an example for typical encroachment. The tank has around 38 ha of waterspread area and around 60 ha of ayacut area. Historically most of the lands in the ayacut were owned by Muslims. In the recent years they are sold out to the Scheduled Caste villagers. Paddy as a single crop is cultivated in the entire ayacut. The tank has a bund of 3 kms length passing along the northern side of the village. A road passes by the side of the bund. The entire length of tank bund is encroached for small houses, tea shops, welding shops, cattle sheds, fuel wood yards, waste dumps, petty shops and for raising nursery. The encroachments have been done by all the castes, irrespective of their economic status. Apart from the tank bund, around 24 ha of tankbed in the foreshore has also been encroached for agriculture. The tank bed is used as a ground for charcoal making even when the tank has some water. The entire village drainage is also led into the tank. The process of encroachment started for petty shops and over a period it has emerged as a massive encroachment. Though several complaints and petitions have been made by different groups in the villages, there was no concrete efforts made by the government to remove them. The issue has become complicated because of the caste problems and the politicisation of village. It is estimated that around Five Million Rupees worth of buildings alone are there on the tankbed and bund apart from the encroached area for agriculture. Eviction of such permanent encroachment is becoming extremely difficult even in small villages for want of governmental action to help the local communities.

Table - 4 Encroachments and Encroachers - Private

Encroachments on	Encroached by	Purpose	Nature of Damage
Feeder Channels	Adjoining land owners	Cultivation; well digging	<ul style="list-style-type: none"> * Reduced flow to tank. * Completely stopping flow and death of the tank
Surplus channels	Adjoining land owners and others	Cultivation; well digging	<ul style="list-style-type: none"> * Constrained outflow * Breaches of tanks and Floods
Foreshore lands	Adjoining land owners	Seasonal cultivation, tree plantation, routine cultivation	<ul style="list-style-type: none"> * Siltation * Reduced storage * Man made breaches of tank bund and demolition of surplus weirs.
Tank Beds	Adjoining land owners and others	Cultivation, housing, all purposes	<ul style="list-style-type: none"> * Death of the tank
Tank Bunds	Adjoining land owners	Extending the cultivation, dumping yards, hutments ,cattle sheds	<ul style="list-style-type: none"> * Weakening of bunds * Breaches of tank bunds * Death of the tank

such as cultivation, well digging, tree plantation, housing, dumping yards and cattle sheds. The government departments like Highways and Panchayat, housing boards and municipalities mostly do the public encroachments. The encroachments by the government agencies are arising out of the poor understanding of the hydrology of the tank, and disregard for government rules prohibiting such uses. The common encroachments are the roads built on feeder channels, offices and courts built on tank beds. The tables 4&5 depicts this in detail.

Table - 5 Encroachments by Government and Local Bodies

Encroachments on	Encroached by	Purpose	Nature of Damage
Feeder Channels	Panchayat & Highways	Road making	* Reduced flow to tanks * Completely stopping the flow resulting in death of the tank
Surplus Channels	Panchayat & Highways	Road making	* Constrained outflow of surplus water * Breaches of Tank bunds and loss of water * Death of the Tank
Tank Beds	Housing Boards	Housing, Housing Sites, Busstand, Bus Depots	* Death of the tank
Tank Beds	Other Departments of Government	Thrashing floor, school and office buildings of Government	* Reduced storage * Extinction of tank
Tank Beds and other water bodies	Panchayats	Office & other building construction	* Reduced storage * Death of the Tank

Infestation of weeds

Large-scale infestation of weeds is observed in majority of the tanks. These weeds are mostly Juliflora jungles and Ipomea cornea shrubs. Juliflora jungles are thorny bushes regenerating on their own without water. They occupy most part of the tank bunds, waterspreads and feeder channels. These impede any development work by the locals. Ipomea cornea is one of the major succulent weeds growing in the water spread areas of tanks. They spread very fast choking up the entire waterspread. It is found that most of the tanks infested by these

Box - 2 Weed Infestation and loss of grazing lands

In Thalambedu village in Thirukkalukkundram block of Kancheepuram district, of Tamil Nadu the tank foreshore and the adjoining lands were the major source of grazing ground till 1960's. The village, which was known for intensive cattle rearing for milk, had been using around 100ha of the tank bed for grazing. They have slowly lost 80% of the tank bed to weeds and encroachments. In the recent thirty years, it is reflected in the decline of cattle economy of the village. While the cattle population is reduced to half, the farmers have to resort to purchase of green fodder from the farmers raising it in their cultivable lands. Presently, half of the fodder requirement is purchased in the village to sustain their shrinking cattle population.

weeds are unusable for the grazing activity besides causing losses to the agricultural income in the villages.

Because of these weeds, farmers do not remove silt and the renovation work is hampered. It is also reported that Ipomea weeds over a period contaminate the water causing diseases to animals and people who use tank water. Most of the channels serving the tanks are also occupied by the weeds, resulting in heavy siltation and affecting the inflows. The menace of the weeds is on the rise in the recent years in an alarming proportion.

Siltation of Tank beds and Channels

The tanks are age-old structures made of earthen embankments and locally available construction materials. Continuous human activity on the catchment and deforestation results in erosion of topsoil. The silt thus moved by the running water through erosion is filling the tanks every year. The removal of tank silt and its application on agricultural lands is a traditional activity done by villagers to benefit the crops.

Box - 3 Feeder Channels, the lifeline of Tanks

The tanks are man-made and the channels are trained to carry rain water, to several tanks forming tank cascades. In all such cascades, the feeder channels are the lifelines.

Pirandodi feeder channel is one such channel carrying water from an ephemeral river called Thirumani Muthar in Kottampatty block located in Madurai District of Tamil Nadu. The channel conveys water to 19 tanks directly and 23 tanks indirectly. These tanks are located in 19 villages in six Panchayats. According to the available records published in 1918, the channel was 1,730 m long and 6 m wide at the diversion till it reaches the first tank named Pirandodi. From the diversion weir it has to carry a maximum flow of 1,578 cusecs. The combined ayacut of all the tanks put together is around 600 acres.

Over the period till 1997, it was found that the entire length of channel had been encroached by the adjoining landowners reducing the width to a maximum of 2½ m. The depth of the channel at the origin is around 3 m at the diversion and 1m at the place it reaches the first tank. The channel was silted up heavily and the maximum depth available was less than 1m throughout the channel. Resultant to the encroachment and the siltation the channel could never carry the designed flow to serve the dependent tanks during the last 40 years.

The channel was therefore redesigned and desilted during the year 1997 and the work resulted in serving all the tanks with the ayacut of 240 ha. The villagers realize that when the channels are cleared of encroachments and revived upto their design standards, would definitely help in retrieving the areas served by the tanks and the agriculture.

These activities have been stopped by the farmers because of the changes in the cropping pattern, application of fertilizers and chemical manure. Over the years, the non-removal of silt annually has resulted in heavy siltation. The storage capacity of tanks is getting reduced at an accelerated rate, leading to a continuous decline in irrigable area. Further the reducing storage causes problems in water distribution among the farmers resulting in severe conflicts.

Dilapidated and weak tank bunds

Many of the tank bunds are very weak and are in need of strengthening. The bunds, which are made of earth are prone to sliding and collapsing due to human activity on top of it. Usually, many village tank bunds are used by the cattle rearers to put their cattle. Also, the bunds in many villages act as a path way to the adjoining villages and the fields. The bunds need to be strengthened periodically to avoid any possible breaches. Since there are not many projects, such strengthening measures have not happened resulting in weak bunds and breaches. The tank with weak bunds cannot hold up to its full tank level and so the villagers dispose of the monsoon flows even when they are in need of such precious water. Further, the infestation of weeds and jungles on the bunds and poor maintenance works result in weak bunds and cause breaches and damages to the tank structures, crops and adjoining lands. The damage due to weak bunds in a chain of tanks lead to collapse of most of the tanks below in a chain. For example, the low intensity flood of 1993 had caused breaches in more than thousand tanks in a span of seven days in four Southern districts of Tamil Nadu.

Dwindling usufruct revenues

The tanks are known for its sustained source of revenue generation from time immemorial in the villages. Such revenue is for village functions, festivals and other common expenses of the village collective. The tank silt, trees on the bund, fuel wood trees on the tank bed, sand in the channels, silt in tank beds and fish from the tank water are the common usufructs available from tanks. In the recent years, the revenue

Box - 4 The city of Madurai and Vanishing Tanks

Madurai is a historical city in South Tamil Nadu located on the banks of the river Vaigai. The place was declared a municipal town in the year 1857 with an areal extent of 6.63 sq. km and a population of 41,600. Currently (2001) the areal extent has increased around 51.82 sq. km with a population of more than one million. During this urbanization process around 13 adjoining revenue villages have become part of Madurai city. As the place was known for its prospering agriculture, there were large networks of channels taking off from the Vaigai and Gridumal rivers and feeding several tanks in and around the city. While the river Vaigai has become a major drainage channel for the city, the minor rivers like Gridumal are encroached for urban settlements. Barring a single major channel, all the feeder channels leading to several tanks in the South Madurai city have been encroached and most of them are extinct. In the last fifty years of urban growth around 12 tanks have vanished and numerous channels became dysfunctional. The estimated area of such vanished tanks is around 16.5 sq. kms. An equal extent of the tank agriculture lands has been converted as settlements by the public. All these tank lands including tank beds, channels and bunds have been converted into housing colonies, industrial estates and government buildings. For example, in the last fifty years all the general administration departments such as city corporation, courts - judicial buildings such as courts and advocate chambers, major urban colonies, All India Radio, public utilities like central bus stands and major colleges & educational institutions are constructed on tank beds. Presently there are five major tanks facing threat by the urban growth. This results in the death of these tanks which have not only been a loss to agriculture but also have caused serious drainage problems within the city. The city can not bear even a rainfall of 5cms in a quick down pour without flooding its bus stands and roads thereby bringing the city to a halt. To complicate the water availability situation, the groundwater levels are going down year after year forcing the city administration to supply more water through pipes causing severe strain on the administration and the funds of the local government.

from the usufructs has been coming down in the villages. The existing government powers regarding the generation of usufruct revenue are solely with the government departments and the Panchayats. The local villagers and their collective bodies are not allowed to raise such revenue from tanks. However, most of the revenue coming from the Juliflora jungles are unaccounted and used by the villagers for communal and festival purposes. Since there is no accountability by any one, most of such revenue is misused and the tanks are not cared for.

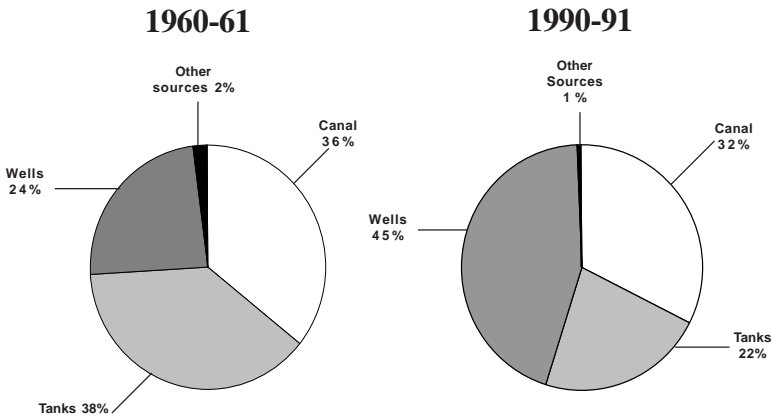
Urbanization and collapse of tank systems

Urbanisation is a phenomenon affecting the tank ecosystem in the fringes of the towns and upcoming towns. The expansion of human settlement poses a big threat to the common properties like tanks and they fall prey to the process. The tanks, are taken over by various departments for construction of government offices, housing colonies, bus depots and other common utilities. The agriculture lands are converted into urban settlements. It is a common scenario in towns that most of the major bus stands, government buildings including courts and major dumping yards are located on tanks. This process kills the tank ecosystem and in the long run affects the groundwater of the entire area. It has been found beyond doubt that the cities like Chennai have faced major groundwater drought due to the total elimination of water bodies which existed in the middle of urban settlements. Also flash floods and severe drainage problems have become a common feature in the cities like Madurai due to the death and decay of tanks in the urban areas.

Decline of Tank Irrigation and Water Supply

The problems explained above has lead to a steady decline of tankfed cultivation in Tamil Nadu. The data compiled by various agencies shows that the trend is steady without respite. The state has lost considerable tankfed lands and the decline may go up.

Consequence to the decline of tanks, the ground water recharges become poorer day by day. The falling water table in agro wells and domestic wells puts continuous pressure on available water and in many places results in a chaos. Therefore, in a hard rock geology like Tamil Nadu decline of tanks only predicts the quick death of groundwater based agriculture and drinking water supplies.



Source: Agrostat, (1996), Government of Tamil Nadu, Chennai

Funding and Implementation of Tank Works

According to the IX th Plan review document of the Public Works Department of Tamil Nadu Government around Rs 1,757 crores is spent on irrigation. This show that the tanks have got 17% of funds and other sources like the canals and dams have got the rest of funds. It is to be kept in mind that no new area is coming under irrigation by any of the major schemes like canals and dams while the area under tanks are being lost.

Though tanks are in existence across the country as a source of irrigation they did not deserve attention of any major national programs. It is conspicuous that there are no countrywide programs as that of the Command Area Development Program(CADP) and Integrated

Watershed Development Programs. More or less the tank programs are left with the state government funds. The minimal employment generation works done by Panchayats and other departments in tanks are of poor quality and had not made any positive results in the overall tank development.

Table - 6 Ninth Plan outlay expenditure

Category of Irrigation Funding	Ninth Plan outlay (Rs. in Crore)	Anticipated expenditure (Rs. in Crore)	% of expenditures to total
Major and Medium Irrigation	720	1321.60	75
Minor Irrigation	515	291.06	17
Flood control and Anti Sea Erosion	65	54.42	3
Command Development	90	89.98	5
Total	1390	1757.07	100

Source: Engineer in Chief (2001), IX Plan review document

5. The Key Actors

The Tanks as common properties have various stakeholders ranging from government agencies, local bodies, irrigators and the general public. The following are the major government organizations involved in governing the tanks.

Water Resources Organization - Public Works Department (WRO-PWD)

The WRO-PWD is the single major department, which administers the tank systems having above 40 ha of command area. Around 8,900 tanks are listed under the administration of WRO-PWD. Historically the department has been the responsible agency for construction and maintenance of all irrigation systems. However since independence, though the department had minor irrigation wing; it financed a very small proportion of its funds for the development of tanks. The maintenance and management budgets of WRO-PWD have always been very low for tanks with an assumption that tanks would be maintained by the local villagers.

The department as a major actor in developing irrigation has not invested adequately on tanks. The bigger investments continued to be in construction projects in the major and medium schemes in the name of modernization and improvements. Such an approach need to be relooked from the reality of 'creating a little' in modernization of major schemes but loosing great extent of smaller tank infrastructure. Therefore safeguarding the existing infrastructure becomes a must in the present scenerio.

Even after several successful experiments on the alternative ways of rehabilitating tanks with farmers participation the department has not institutionalized the learning. The attitude of considering farmers associations as contractors and subjecting them to procedural harassment be stopped, rather the local farmers be encouraged to join the efforts of developing the tanks. The systems and procedures should be changed in favor of the users participation in tank works.

Panchayat Administration

Tanks which have less than 40 ha of ayacut are listed under the administration of Panchayats. The various transfer efforts in the past have resulted in transferring the tanks to Panchayat Unions. Though there are more than 30,000 tanks vested with Panchayats there is no dedicated engineering or trained staff available for maintaining them. Only minimal efforts on tank rehabilitation under the Panchayat administration are made by the Panchayat Unions. There is no scope for bringing any trained man power with the Panchayats to undertake rehabilitation of these tanks on a large scale or move towards a better management system. The usufructuary revenue such as trees, fish and silt are provided to the Panchayat bodies. However there is hardly any realization from them benefiting these water bodies. The present source of funding for tank programs under Panchayat administration is only the employment generation funds. The allocations for minor irrigation from the regular budget are meagre and do not meet the requirements.

It is expected that in the coming years the Panchayat administration would strive for drawing a constant and steady pool of sources of funds to meet the requirement for developing the tanks under its list. The changes in governing the usufructuary income from the tanks in favor of local village tank associations would help in mobilizing local revenue and go a long way to develop and maintain the tanks. The Panchayat administration can have the local village tank associations as part of their working committee giving a legal status under the existing Panchayat Act. Above all the Panchayats should invite the users to participate and implement the works rather than providing to contractors.

Revenue Department

The revenue department represents the 'state' and assumed as having the ownership of tanks. The protection of tanks from encroachment and their conversion for various uses rest with the department. The encroachers are dealt by the revenue department through the regulations set under the village administration. The rise of encroachments is due to several reasons. The lack of will by the administrators of the revenue department is cited as the major reason aiding or abetting the encroachers. The procedures set out for punishing and evicting the encroachers are reported as cumbersome and help the offenders rather than evicting them.

People's expectations are high that as the 'owner' of the tanks the revenue administration would rise up to facing the disastrous situation by changing their procedures related to eviction of encroachments through strong disincentives to the encroachers. Also the department should devise ways and means to turnover land revenue and tax collection rights to the farmers associations.

Forest Department

The Forest Department has been engaged in tree planting activities in the tank beds from the sixties through various projects. The massive program undertaken during the past three decades has resulted in large number of monoculture plantations all over the tank beds. In its enthusiasm of completing the targeted plantations, the department has planted trees everywhere in the tank bed without considering the future maintenance of tanks, such as desilting and rehabilitation activities. Above all, the department prevents any rehabilitation works and at times harass the farmers and villagers for desilting in planted areas. Also, there were no local guardians to safeguard the plantations in the villages, which resulted in a very poor yield of the plantations.

The farmers expect that the department should undertake plantations only in the foreshores of tanks without affecting the future rehabilitation works. The current practices of plantation everywhere be stopped, farmers and others should be allowed to take silt and earth in the planted areas without any difficulties from the department. The responsibilities of guarding the plantations should rest with the local village tank associations with a due share for them from the generated revenue.

Agricultural Engineering Department

The Department is designated for undertaking comprehensive soil and water conservation measures across the state and is involved in tank development works also. Special schemes like ex-zameen tank rehabilitation works were carried out by the department in the small tanks. Also, the Department had undertaken the construction of a large number of percolation ponds as part of their soil and water conservation works. However, villagers feel their work does not invite any local participation and the quality of works remain far from satisfactory. Most often their practice of making a smaller percolation tank near the existing tanks be stopped rather the funds be better used for tank development.

People expect from the department to prioritize their work and concentrate on developing and restoring the existing tanks and ponds rather than creating more percolation ponds. The catchment treatment for tanks in the hilly and sloping areas should be attended on priority through local users as compared to other lands in the selected watersheds.

Agricultural University

The Tamil Nadu Agricultural University is the only research agency working on development of suitable crop varieties, extension methods and training programs. However, there was no specific research focus on tankfed areas. The problem of tankfed areas are unique and warrants

dedicated research on water management, and crop production practices. There are no different set of practices, treatments and other improved measures available for tank farmers.

The farmers expect that the university should concentrate on developing alternative cropping systems, newer varieties and cropping pattern suitable for tankfed agriculture across various basins. The engineering and agriculture education should have adequate space for teaching the tank related subjects, including the cost effective measures, simple design of structures, water management practices, etc. Most importantly contingency plans for tankfed agriculture should be made available.

Agriculture Department

The agricultural department plays a crucial role in extending the various new technologies related to crops, water management and pest & diseases in tankfed crops. The network of the departmental staff undertakes generalized programs across state for all kinds of crops. However, the crop yields under tankfed agriculture are far less as compared to canal command areas where the extension programs are assumed to be better.

It is expected that the department should have specific plans and strategies for tankfed areas to increase their yield. Also the department should have contingency plans to equip the farmers to withstand the vagaries of monsoon. Necessary special projects in increasing the production of tankfed paddy, watershed development in adjoining micro catchments should form part of their work.

Philanthropy and Corporate social responsibility

The tanks and ponds have been part of the culture, custom and local philanthropy. As most of the tanks and ponds derived a human name is an indication and intent of philanthropic involvement in the betterment of tanks and ponds. However, it is strange in these days that

philanthropies including the religious and charitable ones, corporate companies and public organizations do not involve in such activity not even for the purpose of posterity. Irrespective of religion, caste or creed what was considered a noble activity till two centuries back did not attract the philanthropy.

Efforts should be made to create an awareness about the need of involvement, using the cultural beliefs of philanthropy and corporate social responsibility for such an activity. Non Resident Indians, who spread over the globe can play a role in bringing their support for the tank revival.

Farmers, Villagers and Public

A general apathy pervades all walks of social life where public systems are misused or over exploited by the general public.

Sufficient awareness, enthusiasm and activism should be kindled using the raging crisis for water in rural and urban areas. Such an awareness will pave way for the general public, farmers and villagers to get involved in protecting the water bodies as a collective effort benefiting themselves and future generations.

6. What needs to be done?

Care of Tanks

In order to meet the growing human and environmental water needs and restore the tank ecosystem, a new strategy is required. This strategy should provide appropriate instruments for the tank dependent agriculture while keeping the multiple use of tanks intact.

We must establish a fundamentally new paradigm for the development, use and conservation of tank systems. This means establishing comprehensive tank development programs everywhere. An alliance of all the stakeholders concerned ranging from government, philanthropy, village communities and general public should be established.

Such a vision shall have the following principles

- The common property resources like tanks, ponds, and channels have survived over time, helping thousands of habitations and millions of population in a sustainable manner. There is no reason why they should collapse for want of any recent inactions or interventions in their management mechanisms.
- The local stakeholders like the farmers and the poor in the villages have kept the system functioning for centuries and the same people with due care and capacity building can still

manage and sustain the productivity of these common properties.

- Opportunities for effective participation of all the stakeholders have to be created as a principle for a better new management.

The following actions shall form the basis of this joint effort

- **Rethinking the objectives of tank management:** The primary goal of the tank management is to enable the tank to provide lasting benefits to all the users without detriment to the environment.
- **The decision-making:** The decision-making functions have to be transferred to appropriate local community groups such as tank farmers and villagers without having apprehensions over their present levels of capacity.
- **Water rights:** The ever increasing clamor and thirst for water by every one across the state should be defined and met to the maximum possible extent. Every customary and local right should be respected, unless it adversely affects any other community in a partisan manner.
- **Institutions and Capacity building:** The governmental and voluntary efforts to provide better water and management systems should start from strengthening the existing organizational mechanisms functioning in the villages. They should be rebuilt or strengthened and their capacities enhanced.
- **Rehabilitation:** Restoration of all water bodies should be seen as a priority rather than constructing any thing new in its place. The new constructions offer very limited scope and returns costing lot more resources and time.
- **Multiple uses and users:** The tendency to focus on single use and the predominant user should be avoided. The ecological and environmental uses, drinking and domestic water, needs of human and livestock would be given adequate priority.

All the Tanks Conserved

A major campaign envisaging conservation and development of all tanks needs to be taken up. A large scale program of conservation and development of tanks will go a long way in keeping the tanks alive. This effort would need a coordinated action from all departments agreeing for a common minimum plan for conservation. Such an effort would warrant WRO-PWD moving away from the present allocation of 17% of budget to an allocation of at least 50% of total budget of water resources development in the state. Also, the major groundwater exploiters such as Industries shall pay the cost of recharges as part of their mandatory contribution to conserve the recharging tanks.

The focus of tank conservation and development programs should converge through a multi-pronged approach to meet the local needs and should never narrow down to irrigation development alone. Drinking water development, weed control in tank areas, environmental conservation such as preserving bird sanctuaries and groundwater recharge will have to go hand in hand to help achieving the primary objective of conserving all tanks in the state.

The conservation and development efforts should go beyond the departmental administration boundaries. The ideal way of undertaking such massive program will have an integrated development of tanks in cascades on priority. The tanks administered by all departments and agencies shall be brought under single program, coordinated by a nodal agency. The tanks should be aggregated for preparing development plans at cascade, watershed or basin levels.

The tanks in urban areas play a crucial role even if they cease to exist as irrigation sources. As the tanks are located in chains spread across a geographical boundary maintaining their hydrological linkages is necessary. Therefore the tanks in urban areas have to be preserved and used for alternative uses such as groundwater recharge mechanisms, recreational facilities and drinking water storage. The tanks adjoining the major cities such as Chennai, Madurai, Trichy,

Coimbatore, Salem and other major district towns should be preserved as sources of drinking water storage, groundwater recharge and recreational facilities.

The tanks should not be parted away from the government for any reason. The abuse of tanks as dumping yards and for construction of public facilities should be stopped forthwith considering their economic and ecological value. Legislation on the lines of the forest laws should be brought and enforced to safeguard the tanks from decay.

People Oriented Governance Established and Strengthened

The promotion of local tank organizations aiming at the development of tanks shall be seen as a priority to be achieved immediately. Such an effort would greatly help the conservation of tanks by empowering the organizations with levying of taxes combined with the responsibility of protecting them. Learning from the history and the past practices, the government should henceforth denounce its hold on administering the tank systems. Such an effort would result in supporting the local village tank associations established for the administration and governance.

The tank should be seen as a source of revenue generation so that the benefits are maximized and the dependence on external sources is reduced. The usufructuary rights over the trees on bunds, tank beds, sand, silt and fish should be given to the local village tank associations on a sharing basis with the local Panchayat. Such a measure would strengthen the local village tank users in building their own funds for maintenance of tanks apart from using the common property for a useful purpose. Also the local Panchayats which do not have the needed executives for the better use of their existing usufructuary rights, would gain from this arrangement.

A Board for the governance of tanks needs to be constituted by having representations from various categories of organizations and at all levels. The various departments apart from the PWD-WRO and

Panchayats shall have a role in highlighting the multiple use and nature of tank systems, thereby upholding the multiple uses of tank ecosystem. Such a Board will have an advisory role in shaping the conservation movement of tanks and helping the local organizations.

Protecting Tanks from Encroachments

As the single major threat for tanks arises from the encroachers, the legal measures to curb and curtail the menace have to be planned. The entire common properties such as tanks need to be resurveyed, boundaries fixed and handed over to the local village tank associations for protection. The offences related to the tank encroachments shall be declared as criminal and punishable.

No part of the tank complex shall be given title (patta) and the base year for consideration of providing title shall only be the settlement before the pre-independence period. Fake titles on tank lands should be reexamined and weeded out with severe punishments for the concerned officers.

Stabilizing the Tankfed Agricultural Incomes

The large number of small holders of agriculture depending on the tanks need to be assisted through appropriate tankfed agronomic practices including extension and training. These measures shall include developing new tankfed crop varieties, systems and water management practices through appropriate research and extension methods, field demonstrations and the media.

Awareness, Education and Research on Tank Ecosystems

The general awareness on tank ecosystems needs to be built up at all levels. The young children and the youth should be facilitated to play an important role by properly motivating them to care for the tank ecosystems. Appropriate environmental programs and promotion efforts to involve various segments of the society need to be

operationalised. The mass media such as Television and Radio should play a major role in enlightening the general public.

The technical education as it stands now, does not provide adequate knowledge and skill at the basic degree levels in Engineering and Agriculture. Considering the potential and contribution of the tank irrigation systems to the state agriculture, the curriculum needs to be revised and updated using modern teaching methods and utilities such as computer models etc., An immediate curriculum revision of Engineering and Agricultural courses should be undertaken with competent people.

The basic research in tank systems such as tank hydrology, estimating runoff and water availability in tanks, prediction of floods and droughts, sociology of tank institutions, economics of tanks and tankfed agriculture and contingency planning are lagging behind. In general enough measures to strengthen the science of tank ecosystems have to be done intensively.

Problems of Tanks



Damaged weir



Damaged sluice



Encroachments by Government buildings



Encroachment for agriculture



Tank beds filled with weeds



Dumping urban wastes

About DHAN Foundation

Since 1992, DHAN Foundation implements tank conservation projects in south India. A sixty member dedicated professional team located in drought prone areas of Tamilnadu, Andhra Pradesh and Karnataka in south India works with a zeal of making the tanks more useful to the rural communities. The program named Vayalagam combines development activism with field implementation .The program has the following major components.



Institution building for the tanks forms the core of the program wherein the communities are mobilised to conserve the tank systems in its entirety.

Integrated tank development component ensures the conservation works are done in a tank cascade basis ensuring highest possible returns.



Tankfed agriculture development provides appropriate methods and techniques in using the water and land efficiently.

Tank endowments, a cash deposit is provided to village tank institutions on a matching basis to sustain their conserved tanks.



DHAN Foundation

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