

**IRRIGATION TANKS AND THEIR TRADITIONAL
LOCAL MANAGEMENT:
A REMARKABLE ANCIENT HISTORY OF INDIA**

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ABSTRACT

India, a South Asian tropical country, has historical evidences of its human interventions in the management of water for agriculture from village water bodies. One such intervention is an irrigation tank. A tank is a simple rainwater harvesting structure designed by early settlers using indigenous wisdom and constructed with the generous support of native rulers and chieftains. There exist 500,000 irrigation tanks in the country, of which 150,000 tanks are located in the semi arid region of Deccan plateau. They are located in hydrologically favourable sites, some of them in sequential chains or cascades, effectively capturing the rainfall and serving multiple uses with irrigation having the major share. Tank irrigation systems are simple but fragile structures. They have to be constantly maintained, monitored and conserved. Even more difficult is sharing the scarce water amongst its consumers, particularly farmers. And yet, people across the country have devised a variety of mechanisms to share the water and maintain their tanks. One such mechanism is a community effort, locally known as “kudimaramath” by which the tank is periodically maintained. In a few tanks, the farmers have formed informal organizations on their own, and undertaken water distribution. But the tanks which are in multiuse are presently under the ‘ownership’ purview of State governments. Their management functions also come under the different line departments with neither integral approach nor common purpose. This has resulted in the steady decline of the performance efficiency and degradation of these precious small scale water bodies. DHAN Foundation has therefore chosen to intervene and restore these multipurpose tank systems to their designed standard and revive their local management by the users through community initiatives. This paper presents the efforts taken and the results obtained to benefit the poor whose very livelihood depends on these water bodies.

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INTRODUCTION

India, a South Asian democratic country, has many historical evidences on irrigation structures, systems and management, almost from 8th century A.D onwards. They captured India's long history of human interventions in the management of village water bodies for agriculture. One such intervention, is an irrigation tank. A tank is a simple earthen banked rainwater harvesting and storage structure, designed by the early settlers using their indigenous wisdom and constructed with the generous support of native rulers and chieftains

over the past several centuries. Surprisingly these earthen structures have withstood the test of time and survived over many centuries. They are simple technological innovations developed by those people to accommodate their primary needs and adapted to the distinctive Indian climate – intense monsoons followed by protracted droughts. A few of the quotes narrated below explain the importance of these precious village water bodies, namely, minor irrigation tanks.



Sir Arthur Cotton, a well known British Engineer who worked in India at the time of Colonial imperialism exclaimed on seeing the constructed tanks:

“The natives have constructed tens of thousands of tanks in almost every kind of soil with earthen bund without the puddle bank, which English Engineers fancied necessary”.

From one of the ancient verses from *Tamil Purananuru*, it could be inferred that the early settlers gave importance to form tanks in the lands wherever depressions were found, so that much of the rainwater could be harvested and stored. The topography of Deccan Plateau provided a good base for locating these innovative water bodies.

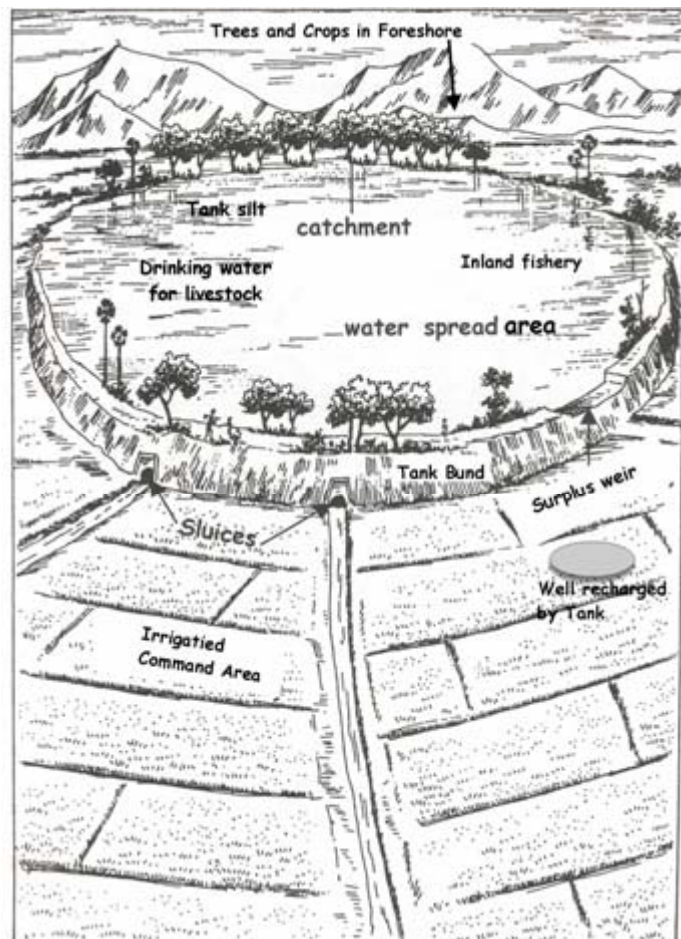


TANKS AND THEIR IMPORTANCE IN INDIAN IRRIGATION HISTORY

Village tanks have been one of the most important water resources on which the rural communities depend for their livelihood. A tank is a village water resource formed by constructing an earthen bund (a man made embankment) across a shallow valley to impound the rainwater runoff from its catchment area. The stored water is utilized by gravity flow to the lands situated below, primarily for irrigation purpose. As small scale irrigation systems, the tanks are easily adaptable to the system of decentralized village administration that prevailed during the mediaeval period and thereafter. The precise shape and size of each tank seem to have been determined by the terrain along with the native wisdom of local villagers. There are quite a few eminent quotes available in the literature praising the contribution of tanks in the development areas. One such quote is presented below:

John Ambler (1994) aptly describes the usefulness of tank systems as follows:

“Tanks need to be thought of in terms of a wide complex of natural resources, physical facilities, land use patterns and managerial institutions. The tank is not simply an irrigation system that starts from the reservoir down. It is also a collection point for run-off from the catchment area, pond for pisciculture, source of silt for fertilization and construction material, a recharge structure for local groundwater, a location for cultivation on common lands, a source of drinking water for livestock, and finally, an irrigation system for crops. To help keep in mind this multiplicity of uses which spans the administrative ambit of several government departments, it is useful to think of tank complexes rather than tanks, which too often connote only the direct surface irrigation aspects of these systems.”



Even in the 21st century, the tanks, not only in Indian context, but also in South Asian context have very high relevance in practicing Integrated Water Resources Management (IWRM). As per minor irrigation census (1994), there exist 500,000 irrigation tanks in the Country; of which 150,000 tanks are located in the Deccan Plateau covered by South Indian States. These irrigation tanks are situated in sequential chains (cascades) with the slope mildly dipping towards the Southern coastal plains. As a result, the rainfall runoff flowing from a sub basin and / or watershed is effectively impounded and harnessed for multiple uses with irrigation being the major user.

TANKS AND THEIR FUNCTIONS:

The tank system has four different functions in irrigated agriculture: soil and water conservation, flood control, drought mitigation and protection of environment of surrounding area. Likewise, development of tank irrigation has to undergo the four phases, namely, water acquisition or harvesting, storage, disposal of surplus water, distribution and management of water in the command area by an institution. The tank complex comprises the catchment area, the feeder channel, tank bund, water spread area, sluice outlets, command area, field distributaries (water courses) and surplus weir.

While the South and East Indian tanks are known for their antiquity and are created essentially as a source for providing supplementary irrigation during monsoon season, innumerable small water holding structures called ponds have been in existence in many North Indian states and some were constructed even after Independence for multiple uses including irrigated agriculture. Although many of these ponds are primarily meant for inland fresh water aquaculture, they have also been used for multiple purposes like irrigated agriculture, livestock and other domestic uses. Tank irrigation has thus a rich heritage on account of long historical antecedents in various regions of India. Over centuries, tanks and ponds constituted an important supplementary source of water to the distressed poor.

TANKS AND SOCIETAL NEEDS:

Tank is a centre of socio economic activities of a village catering to the multifarious needs of the village community. The tank is not simply an irrigation system appended to big reservoirs. It has multiple uses and serves diverse needs of people, animals and plants. Apart from the above, the tanks contribute to the recharge of ground water, microclimate and the environment to keep the surrounding area green and cool. This environment attracts the migratory birds from far and near.

The advantage of tank irrigation is its proximity to the command area, so that the water requirement of the crop can be assessed and supplied from the tank, which is the core issue of water management. Most of the small tanks serve one single village and its hamlets, enabling the de-centralized management to be effective.

IRRIGATION RIGHTS FROM TANKS:

RECORDED *MAMULNAMA* IN VELLORE DISTRICT, TAMIL NADU

In the early years, irrigation rights in tanks were largely governed by custom and local practices. Yet they were not in a proper recorded form. It is quite interesting to observe the recorded irrigation rights of pattadars of 188 tanks of Vellore taluk in 1815 A.D. under the heading “Water *Mamulnamas*”. These were printed by the British in the year 1907. The *Mamulnamas* have been written in Tamil and signed or attested with thumb impression by the “Karnam” (Accountant of Village land records) and important farmers of the village. (Source: An English version of the *Mamulnama* extracted from G.O.No.660 I; dated 8th February 1918 and cited by Sivasubramanian K., 1995). It is astonishing to note how meticulously the *Mamulnamas* have been written, recording the period in which the tanks got water supply, the quantity of water available in particular months, the area that could be irrigated, when the tanks got full supply and the distress period, the mode of irrigation, the permissible number of wells that could be sunk in the *ayacut*, (command area of tank) the crops that could be cultivated in the area etc.

Even though the irrigation rights and practices were not recorded in all the tanks, they were meticulously observed by the ryots and the community from time immemorial. However, some customary rights could be ascertained from the “A” register maintained by the revenue department and the old settlement records. These customary rights along with *Kudimaramath* systems (described below) were followed with high dedication and vigil by the ryots and villagers during the 15th century A.D. and even under East India company rule for some time. But after the introduction of Ryotwari settlements by the middle of 19th century, the effectiveness of the traditional system deteriorated progressively, with the result the tanks were not maintained properly in the country.

LOCAL MANAGEMENT OF TANKS IN PRE COLONIAL PERIOD:

The feeder channels to the tank and water distribution channels from the sluice outlets were desilted and restructured by community effort, locally known as “*kudimaramath*”. In a few tanks, the farmers had formed informal organisations on their own, with specific roles and responsibilities allocated to each member through consensus, so that water distribution could be equitable and the tank maintenance be effective. Before the advent of British rule, ownership of water bodies and land was with the community and village assemblies. The powers and functions the village assemblies possessed over irrigation, especially from the tanks include:

- Ownership of water resources
- Construction, repairs and maintenance of water bodies
- Transactions related to irrigated lands
- Management of water distribution
- Dispute settlement
- Relationship with government agencies on certain matters

(Source: Annual report of Epigraphy 1934-35 and Pudukottai inscriptions)

The ancient donors did not stop their work after creating tanks. They also provided grants and tax remissions to those maintaining the tank to ensure their good repair. The striking feature is the care which they took to maintain all these structures for sustained irrigation. They had a very elaborate system of management including repairs, maintenance and improvements. The tanks, channels and sluices, especially those which were not wholly built of stones, bricks and mortar, required great care in order to maintain them in good condition. Frequent removal of silt was considered to be the most essential aspect of the maintenance of tank complexes. The breaches in tank bunds and supply channels due to excessive rainfall and floods had to be repaired promptly. But, the wanton damage done to irrigation works was certainly not known in those days. Many South Indian inscriptions contain description and references to the damages caused to irrigation works on account of heavy rains and floods, the action taken by *Urar* and *Sabas* for the upkeep of the tank complexes and also the endowment created for the maintenance and repair works by individuals. The village assemblies managed the water from the tanks systematically, ensuring equitable water distribution to all the needy villagers. They also maintained the physical structures of the tank in good condition.

WATER SHARING AND MANAGEMENT OF TANK SYSTEMS

Tank irrigation systems are simple but fragile structures. They have to be continuously maintained, promptly repaired and constantly monitored. Even more difficult is sharing the scarce water amongst its consumers, particularly the farmers. And yet, people across the country have devised a variety of property right mechanisms to share water and to maintain their tanks. To ensure equity in the distribution of tank water, villagers in some tank commands elect one among them or appoint a landless person as a water guide and/or water manager, locally known as "*Neerkatti*". The *Neerkatti* ensures that each farmer receives tank water in proportion to the area of land he owns. Therefore conflicts over the use of water are rare. When the *Neerkatti* is elected from among the local farming households, the position of *Neerkatti* rotates among all households on a turn basis to ensure that no household monopolises this critical post. The broad functions carried out by the *Neerkatti* are:

- Watch and ward of tank assets and preventing wastage of water
- Water management functions (includes normal water supply and scarcity water management)
- Mobilise village labour for periodical tank maintenance and at times of flood damage to tank structures

Neerkatti is paid remuneration as a share of the crop produced, with a fixed quantum of grains per land holder, and allocation of some common land for cultivation. His appointment and fixation of norms and functions are managed by informal village assemblies.

THE EAST INDIA COMPANY AND BRITISH RULE

When the British East India Company annexed Indian territories, the tank irrigation systems also became the company's property. But the British administration did little to rejuvenate the sustainable management of tanks. They spent little on tank rehabilitation and maintenance.

Presently in India, the tanks which are in multiuse and multiple user system come under the 'ownership' purview of 'State government departments'. Their management functions also come under the different line departments with neither integral approach nor common purpose, which led to the decline of such irrigation marvels.

TANK PROGRAMME OF DHAN FOUNDATION

Even though the tanks form the backbone for the survival of human beings and provide support for agriculture in several parts of peninsular India, it is appalling to note that there has not been much importance given by the formal disciplines and professions. DHAN Foundation has therefore chosen to intervene to restore these multipurpose tanks to their designed standard and performance efficiency, by mobilizing the users, organizing them into associations and undertaking the restoration work through them, thereby reviving the traditional local management.

The program has a number of components that are necessary to ensure that the interventions are sustainable in the long term. The measures that are proposed in rehabilitation of tanks comprise improvements not only to the physical works but also the software aspects like operation, maintenance and management of water resources. They comprise the following:

PRIORITIZATION OF TANKS FOR REHABILITATION

The tank irrigation systems taken up for rehabilitation are spread over the four states of Tamilnadu, Andhra Pradesh, Karnataka and Pondicherry. The tanks are selected based on the scope for working with the marginal communities in tankfed agriculture. The villages and tanks are identified in such a way that cascades of tanks are selected and all the tanks in each cascade are improved in a phased manner based on the following criteria:

- Willingness farmers to contribute a part of the project cost through labour and/ or cash; while the landless will contribute labour.
- Willingness of the community to execute the works themselves without involving contractors and maintain and manage the system thereafter.
- Participation of both women and men in planning and implementation of the program.

TANK INSTITUTIONS AND THEIR ROLES

DHAN Foundation facilitated a three tier system of community participation.

(i) Tank Farmers Associations (TFAs)

- Enrolling the farmers having land and the other interested groups in the village under the command area, as members.
- Planning and implementing development works like tank rehabilitation, community well construction and on-farm development.
- Undertaking activities such as pisciculture, tree planting and brick making as a measure of generating revenue for the tank associations.
- Maintenance of tank systems and their management including water distribution.
- Building up a corpus or endowment for the tanks for maintaining and managing the tanks through the revenue.

(ii) Tank Cascade Associations (TCAs)

- Formed with the Tank Farmers Associations as members across the cascade.
- Undertaking the development works such as cleaning and excavation of feeder channels and repairs to diversion weirs/ regulators on feeder channels.
- Resolving conflicts among the Tank Farmers' Associations in water sharing and maintenance.
- Mobilising funds across villages for the betterment of the tank irrigation systems.
- Providing improved services on agriculture and water management.

(iii) Tank Farmers Federations (TFFs)

- Formed with the Tank Farmers Associations as members.
- Organising the tank farmers federation in the administrative district or block level.
- Mobilising funds for the rehabilitation of tanks from various sources including the District, State and Central government administrations.
- Organising training programs on tank related aspects for the TFAs, TCAs.
- Monitoring the operation & maintenance of rehabilitated tank systems and the performance of TFAs and TCAs.

DHAN perceives that these arrangements empower the organisations to conserve and maintain tank irrigation systems during the years to come in a sustained manner.

TANK REHABILITATION

Tank rehabilitation includes not only restoring the physical structures to their originally designed standard, but more importantly, facilitating the proper maintenance, efficient water management and improved cropping practices in a sustained manner.

PRIORITISATION OF WORKS

The people's felt needs and priorities are given importance in formulating detailed work plans and cost estimates, as the planning itself is done with people's involvement. The works included in the tank rehabilitation follow an order of priority, which the users perceive as most important.

- i. Acquisition of water
- ii. System restoration
- iii. Improvements to water use efficiency
- iv. Tankfed agriculture development
- v. Micro finance activities (MFAs)
- vi. Endowment for TFAs

EXPERIENCE OF DHAN FOUNDATION

DHAN Foundation's tank program came into being from the analysis of rural situation in the chronically drought prone areas of Tamil Nadu. The tanks need to be saved from extinction. DHAN's efforts in working with the small and marginal landholders for the restoration of tank irrigation and regeneration of farmers' management have met with success. Water as the basic input for farming in dry tracts has brought tremendous benefits in the life of farming communities. The farmers are organised around the tanks with DHAN's efforts to conserve the tanks and improve their performance. The first phase of the project (1992-'95) was initiated with the objective of rehabilitating a few tanks. By this effort, their storage capacity could be increased and water supply to the crops could be made reliable. The experience gained from this phase provided the realization that the program should be multifaceted and that there was need to work with various other actors concerned with tank systems. So the project involved constant interaction with the local and state government agencies for funding, approving project proposals and changing their perspectives and policies for a better tank administration in the second phase (1996-99). Through the years, DHAN Foundation has undertaken more than 650 units of development works such as tank rehabilitation, community well construction, drinking water development works and watershed development works covering nearly 78,350 farmers and benefiting their small holdings in the dry areas of South India, through more than 1050 Tank Farmers' Associations (Vayalagams) and 11 Federal Associations.

DHANs' program is presently focussed towards the effective rehabilitation of tanks through management by the farmers and by building their stake. Also, in the last ten years, the project could take up many issues related to tank rehabilitation and agricultural development with people's participation, investment, and management transfer and ownership rights to many forums. The program has in recent times gained importance nationally and internationally for its sustained and innovative work towards this poverty alleviating natural resources management.

VAYALAGAM MOVEMENT

Vayalagam movement is conceived as an offshoot of advocacy efforts of tank farmers and their associations at various levels. The activities are mainly aimed at mobilising the participation of tank farmers from different states in the country. By getting together, they feel that they could be strengthened and better able to speak out on issues pertaining to the conservation of small scale water bodies like tanks, farm ponds and drinking water ponds.

Approximately 40,000 tank farmers spread over Tamil Nadu, Andhra Pradesh, Karnataka had gathered at Madurai, on September 28, 2005. Their demand for self-determination, empowerment, self governance and their desire to preserve and improve their capacity to manage the water resources further, fuelled their efforts to establish the movement. It was spear headed by a group of leaders drawn from the tank farmers' federations at district level. This event provided an opportunity for the tank farmers to be seen and heard at National and International levels.

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