

Regenerating Kudimaramathu – the Water Governance by People: an Emergent Solution to Protect Water Bodies in Tamil Nadu

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ABSTRACT

“The traditional irrigation tanks in Tamil Nadu are the primary source of livelihood not only for farmers but also to millions of landless agricultural labourers. Presently there is an emergent need for protection of traditional irrigation tanks through concerted and collaborative efforts by all stake-holders from the diversified domains. The local communities, specifically the younger generation, should strive for reclaiming their ownership and should collectively participate in tank protection measures. Agriculture is still the primary source of livelihood for nearly 40 percentage of the people in Tamil Nadu. Performance of agriculture is declining mainly due to rapid increase of water shortages. Tamil Nadu can augment availability of water for irrigation by properly maintaining the traditional irrigation structures. It was firmly believed that the poor maintenance of 4000 water bodies in Tiruvallur and Kancheepuram districts was one of the main reasons for inundating Chennai Metropolitan city during 2015 floods. It also had caused severe damage to standing crops in both districts. Our ancestors not only built these traditional irrigation tanks but also they had actively participated in operations and maintenance of tanks and irrigation management processes. Our ancestors had planned, implemented and led their own sustainable development process locally depending on availability of water in the traditional irrigation tank. The present generation doesn't need to do anything different but simply follow the footsteps of our ancestors who had safeguarded and nurtured the water bodies through 'Kudimaramathu'. The traditional irrigation tanks even today play a vital role for livelihood and sustainable development of rural communities. Protection and maintenance of traditional irrigation tanks is the primary responsibility of all stake-holders. Kudimaramathu was the meticulous way of operations and maintenance of tanks which is still worth to be practiced with the values of equity and social justice. In the context of severe water crisis in Tamil Nadu, protecting the remaining 3900 traditional irrigation tanks must be the top most priority of Government of Tamil Nadu. Professional social workers have significant role to play. This paper will focus on the need for regenerating traditional methods of water management and call for the professional social workers towards leading and facilitating sustainable community development process.

Key words : Farmer, Agriculture, Traditional irrigation tanks, Feeder Channels, Water crisis, Tamil Nadu, Water resources Management, Community participation, Role of professional social workers.

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Introduction

Mahatma Gandhi, the Father of our Nation, had said that *"The earth has enough resources to meet the needs of all but not enough to satisfy the greed of even one person"*. Not only Traditional irrigation tanks, all water bodies in Tamil Nadu have severely been victimized by the greed of human beings. Poor maintenance of traditional water tanks, encroachment of feeder channels, improper maintenance of sluices and weirs are some of the key issues.

One of the most essential gifts of God to mankind is water. Without water, life is totally impossible. We don't even give a second thought to the importance of water in our lives. The modern era of globalization and the careless approach has hugely affected the usable water reservoirs. It is high time that all our conscious and concerted efforts focus on safeguarding and nurturing our water bodies (Maude Barlow, 2003).

Water and Poverty are interconnected. Access to adequate water is essential for leading life with dignity, especially for poor families and farmers who struggle everyday for securing adequate water for domestic use and irrigation purpose. Availability and accessibility to water in sufficient quantities would determine the children's health and livelihood of families. Without sufficient water the children may fall sick at regular intervals and crops may die pushing people to lead a life of uncertainties and to the edge of existence (Kassim Kulindwa and Haakon Lein, 2008).

The water crisis that is faced by the people of Tamil Nadu today is essentially a man-made crisis (Vibhu Nayar, 2012). It has been the collective failure of all the stakeholders to protect the micro artificial water harvesting structures which is going to make our future generations suffer.

Recorded history of South India reveals that water management was done through a large network of tanks. Tamil Nadu, in particular, has an amazing history of rainwater harvesting through micro-tanks from Western Ghats to Bay of Bengal. Andhra Pradesh, Karnataka and Tamil Nadu account for nearly 60 per cent of the tank irrigated area. There are about 120,000 tanks in these 3 states as against 208,000 tanks in the country (Vaidyanathan, 2001). Village tanks contributed for ensuring sustainable livelihood opportunities for marginalized sections of the rural communities.

Tamil Nadu Approximately gets 34.9% of rainfall from Southwest Monsoon (June – September) and 47.8% from the Northeast Monsoon (October – December) while winter and summer seasons give 3.4% and 13.9% rainfall respectively. Tamil Nadu is clearly one of the water starved states in India as is endowed with only 3 percent of water resources. The state's average annual rainfall is 920 millimeters which is below the national average of 1200 millimeters. 89 reservoirs and 39,200 irrigation tanks along with 17 major river basins have been meeting the irrigation needs of 24 lakh hectares with the total surface water potential of 24,864 Million Cubic Metre (MCM). As the state is located in the rain shadow region of the Western Ghats, it is getting limited annual rainfall. The per capita availability of water in the state is 750 cubic meters per annum compared to the national average of 2100 cubic meters which indicates water scarce context of Tamil Nadu. 75 percent of the water is being used for irrigating 3 million hectares of agricultural land which is 54 percent of the total crop land. Canal irrigation covers 30 percent of the total irrigated area, 49 percent is irrigated by wells while traditional tanks cover upto 21 percent (ADB, 2006).

The ancestors of Tamil Nadu were pioneers of innovations in water management. They always saw water as a gift of nature, belonging to all the living things on earth. The 2nd century BC Grand Anicut across the Cauvery is a testimony to the technical competence of ancient engineering. Their wisdom and concern for the future generations is quite evident as one can see thousands of tanks still being used by their grand-grand children. Using the gentle slope from Western Ghats to Bay of Bengal, our ancestors created these artificial water harvesting structures to be used for irrigation and other domestic purposes (Sakthivadivel *et al.*, 2004).

In the context of erratic distribution of rainfall (much of the rainfall occurs in three to four months in a year), the traditional irrigation tanks play significant role in conserving water which otherwise would confluence with the sea. Tanks reduce the instant surface runoff through storage and secondly contribute for recharging ground water tables.

A traditional irrigation tank for a village was constructed aiming to be the primary source of sustainable development. It meets the multiple needs of the village community. The tank is not only for irrigation but also for meeting the diversified needs of

people, animals and plants. The need of the hour is to revive and restore traditional water bodies with the community participation before the situation turns more dangerous (Venkaiah Naidu, 2018). The tanks have significant contribution in recharging ground water. As the tanks are situated very close to tank ayacut area; the supply of water to agriculture fields happens in a quick time using the gentle slope. As most of the tanks serve one or couple of hamlets or villages, it would be feasible to enable the decentralized governance leading to effective water resources management.

Tamil Nadu, according to 2011 census, has 70% of small farmers with less than one hectare of land-holding. Not only the small farmers but also the agricultural labourers (nearly about 30%) are also heavily dependent on agriculture as primary source of livelihood (Jothi Sivagnanam, 2011). Their life with dignity now is under serious threat due to deteriorating condition of water bodies, especially the traditional irrigation tanks in the villages.

Protection of water bodies is directly linked with right to life with dignity, right to livelihood and right to safe drinking water. The traditional water bodies in Tamil Nadu are the 'right to dignified life' bestowed on present and future generations by our ancestors. Without protecting the traditional water bodies the present and future generations cannot live with dignity. Revival of traditional irrigation tanks should receive greater attention as they need small investments and simpler engineering solutions which can be implemented by farmers themselves. Water is a collective resource which calls for collaborative efforts from all its users. The tank management essentially needs to be a local affair.

Maintenance of an irrigation system is crucial for the development of sustainable agriculture. It has been globally recognized that eliciting the participation of local communities for water resources management is effective, particularly in the labour intensive countries (Kajisa, 2019). But with the advent of globalization and increasing job opportunities in urban centers, the productive age group of the rural settlements has been migrating to nearby town and cities.

Water resources management cannot be a complete process without the involvement of women. Women are important players in agriculture water management as they play a key role in water and land conservation, rainwater harvesting, and watershed management. According to FAO estimates,

women account for an average of 43 per cent of the agricultural labour force in developing countries but in spite of this, water policies related to agriculture continually assume wrongly that farmers are men, thus marginalizing women in water resource management (FAO, 2011).

Review of Pertinent Literature

Surface Water Potential of Tamil Nadu

Policy Note (2017 and 2018) of Public Works Department, Government of Tamil Nadu, have stated that Tamil Nadu has 17 major river basins and 89 dams. It has estimated the State's total surface water potential as 885 TMCft which included 264 TMCft of water received from the neighbouring States. Tamil Nadu Water and Drainage (TWAD) Board has stated that 39200 tanks are serving people of Tamil Nadu with 347 TMCft of water where as the combined storage of all dams put together is 243 TMCft. It is quite unfortunate that the 39200 traditional water bodies have been neglected though they have been playing significant role in boosting the rural economy through irrigating nearly about one hectares of agricultural land.

Status of Traditional irrigation tanks in Tamil Nadu

Of 39200, 10,520 tanks are under the custodial jurisdiction of Water Resources Department, Government of Tamil Nadu and remaining are under the Department of Rural Development. An irrigation tank that has the command area of 40 hectares or more comes under the jurisdiction of Water Resources Department.

The issues as identified by Environment Assessment Reports of IAMWARM Project are enlisted below (Government of Tamil Nadu, 2006 and 2017).

- Encroachment in supply channels, water spread area and tank bund
- Supply channels are missing
- Accumulation of silt in supply channels
- Accumulation of silt in water spread area of the tank
- Reduced storage capacity of the tanks
- Illegal sand and soil mining. Huge ditches created by soil mining has made the tank unfit for serving irrigation purpose
- Dumping of debris in tanks

Water Crisis in Tamil Nadu

Tamil Nadu had witnessed two contrasting and ex-

treme ecological scenarios in successive years starting from 2015. Tamil Nadu received 53% more rainfall in 2015, mostly in northern part of the state. In 2015 it was historical rainfall which was unevenly distributed and in 2016 it was historical drought. Tamil Nadu received 63% deficit rainfall during 2016 (Lakshmi, 2016). According to Meteorology Department, the monsoon failure caused almost 62% deficit rainfall. Karnataka's refusal to release full quota of water (released only 66 TMCft as against the full quota of 179 TMCft) added more problems to the already growing water crisis in the state. The water crisis situation in Tamil Nadu is still persisting. The Honorable Chief Minister of Tamil Nadu had stated that the state received only 168.3 mm of rainfall during the North-East monsoon as against the normal rainfall of 440.4 mm – a deficit of 62%. The press release statement also quoted the 20% deficit rainfall from South-West monsoon. All the districts were severely hit by deficit rainfall ranging from 35% to 81%. (TNSDMA, 2017).

Ground water levels in many districts in Tamil Nadu are depleting at the faster rate than it could be replenished. Ground water levels in Tiruvallur, Kancheepuram and Vellore have dropped by an average of 1 meter in the recent past. Ground water level in Tiruvallur was at 5.4 meters in January 2019 and went down to 5.89 meters in February 2019 (Madhumitha Viswanath, 2019). As surface water potential is decreasing, water for agriculture mainly is drawn from ground water sources. Many experts have already cautioned that Tamil Nadu is overexploiting ground water reserves. This is a dangerous sign. The ground water is the reserved stock stored since billion years for many more generations to come. Tamil Nadu cannot afford to exploit ground water resource as it is being done now, if so the entire Tamil Nadu will be a desert.

Water scarcity is now being perceived as drought. The water scarcity in Tamil Nadu and other Southern states during 2016-17 was mainly due to several human factors like negligence and destruction of water bodies, policy failures, improper water distribution and inadequate management of public water sources. Mr Rajendra Singh, popularly known as water man of India, urged people of Tamil Nadu to collectively oppose any act of destruction of natural resources and work collectively to revive the dying rivers and water bodies (Rajendra Singh, 2017). Water conflicts have now reached every level in India. It is dividing every seg-

ment of our society. There have been conflicts between states, districts, villages, castes and groups (Bkisham Gujja, *et al.*, 2006). Tamil Nadu has been witnessing conflicts over water at all levels. Water conflicts are mainly due to mismanagement of water resources. The present drawback in the water management is mainly due to non-adoption of the "Dublin" principles (International Conference on Water and Environment held at Dublin during 1992) which insisted that 'Water Resources Development and Management should be based on participatory approaches involving all relevant water users'. Poor maintenance of water resources in Tamil Nadu is said to be one of the major causes for water crisis.

Raise and decline of community management of traditional irrigation tanks

Fortunately there are some meticulously documented information of the process through which the communities were carrying out tank operation and maintenance interventions. They were governed by customs and traditions which were passed on from one generation to the next till the advent of British rule. The community management of water bodies was called 'Kudimaramathu'. The traditional irrigation systems, which prevailed in Tamil Nadu and in other parts of India as well, reflected the rights enjoyed by the village societies over water and other natural resources. The community had complete control and access over water resources within their jurisdiction. The system was functioning well and there existed well laid out rules and regulations to undertake all critical functions of water management such as system maintenance, water sharing (particularly during the times of scarcity), conflict resolution, collection of penalty for non-participation in the maintenance work and so forth. There existed a hierarchy of functionaries to undertake all these activities (Sivasubramaniyan, 2006). The caste structure played a crucial role in preserving and allocating responsibilities among various functionaries. For instance, a farmer invariably held the position as a canal manager from a high caste and the position of irrigation workers (menials) was held only by people from scheduled castes. Nevertheless, the traditional irrigation institution had an enforcement mechanism, which facilitated a smooth functioning of water control systems. The system was called 'Kudimaramathu'.

The voluntary community labour or what was

called Kudimaramathu system began to decline from around the middle of the 19th century. The Colonial Government was quick in recognizing all the local customs / conventions and acquired water rights of people. The village settlements carried out by the British administration in different parts of the country since the second half of 19th century had, in particular, recognized the Kudimaramathu system (system of community labour for maintenance) and its associated rules and regulations for water management. However, the Kudimaramathu system, which worked well until the beginning of the British rule, started declining from around the middle of 19th century. The public debate on the deterioration of tank irrigation system has been the priority point of discussion since the middle of 19th century. The Report of the Public Works Commission of 1852 revealed that there was not much of voluntary community labour and it reported that labour was more or less forced in all districts (Sarada Raju, 1942). The main reason attributed for the decline was disintegration of village society. The Irrigation Commission 1901 pointed out factions, absentee landlordism and the decline in the power of village headman as reasons for decline of Kudimaramathu system. Madras Compulsory Labour Act was passed in 1858, which was also known as the Kudimaramath Act, in order for legalizing compulsory labor for certain aspects of tank maintenance. This act failed to bring about any fundamental changes in Kudimaramathu system. Moreover, the act forced for the voluntary labour of farmers (water users) in tank maintenance work (Janakarajan, 1993).

Kudimaramathu can still be found in Tamil Nadu

Traditional irrigation tanks in Tamil Nadu were once managed by the local institutions in the name of Kudimaramathu. Since the beginning of 20th century, the practice of Kudimaramathu has been undergoing several changes, due mainly to increasing number of farmers, changes in land-holding pattern, changes in attitude of farmers and most importantly increase in the number of well irrigation in the tank command area.

But Kudimaramathu has not been vanished completely. It's presence can be felt in many places throughout Tamil Nadu in different forms. Even now, many villages in Tamil Nadu have traditional institutions for managing tanks effectively. They treat irrigation tank as a common property and mobilize resources both from internal and external

sources for undertaking maintenance measures of the tank (Asian Development Bank, 2006).

Parambur is a village in Pudukottai District of Tamil Nadu which has a big irrigation tank. Parambur village has a farmers' association with well laid provisions for operations and maintenance of the irrigation tank. It is mandatory for the members of the farmers' association in Parambur to participate in cleaning the feeder channel. Farmers who cannot provide voluntary labour are asked to pay the wages for the wage-laborers engaged for the purpose. They also have common fund with them for taking up minor repair works in the tank. Peikulam in Thoothukkudi district of Tamil Nadu also has a traditional water resources management institution that has been taking care of the wellbeing of irrigation tank. Traditional water management institutions in Tamil Nadu, found in few places, are also determining the cropping pattern for different cropping seasons based on the availability of water. Especially in Parambur, the farmers' association ensures social justice through equitable distribution of water for irrigation during the days of water scarcity (Sakthivadivel *et al.*, 2004).

The lack of collective community ownership, absence of grass root level institutions and dying communal practices have resulted in dilapidated irrigation infrastructure which is caught in a cycle of 'construct-neglect-reconstruct'. The rehabilitation attempts of Government are infrastructure centric and hardware driven, neglecting the voice, choice and wisdom of the community.

Methodology

This study was carried out with farmers of Tiruvallur District in Tamil Nadu who were reeling under severe water crisis. The study was carried out to find out the current status of Traditional Irrigation Tanks that are connected with Araniyar River Sub-basin and Nagariyar River Sub-basin in Tiruvallur District, Tamil Nadu. This study was a prelude to the larger study that would be carried out.

The study mainly focuses on ascertaining the present condition of traditional irrigation tanks and suggest prospects for defining the roles and responsibilities for professional social workers in the context of emergent need for protecting the remaining traditional irrigation tanks. Condition of following aspects of Traditional Irrigation tanks were assessed

in the select tanks of Tiruvallur District.

- Supply or Feeder Channels which bring water to the Traditional Irrigation Tank
- Water Spread area of the Traditional Irrigation Tank
- Tank Bund
- Surplus Weirs & Sluices
- Practice of Kudimaramath

Selection of Sample

It was multi-stage sampling process. Stage one was for the selection of river sub-basins. There are four river sub-basins (Kosasthaliyar, Araniyar, Nandhiyar and Nagariyar) where agricultural activities are going on. Araniyar and Nagariyar river sub-basins were selected through simple random sampling method at the stage one. Selection of tanks was done at the stage two. Two tanks from Nagariyar sub-basin and three tanks from Araniyar sub-basin were selected through simple random sampling tool. At the stage three, the active farmers were selected through purposive sampling tool. This study needed active farmers for getting the required data. From each selected village, Six Subjects (Respondents) were identified for having 'Focus Group Discussion (FGD)' for collecting pertinent data.

The Researcher also interacted with retired engineers of Water Resources Department of Government of Tamil Nadu. Interview Guide was used for facilitating FGD. The Researcher also had transect walk along with the farmers for assessing the condition of Traditional Irrigation Tank.

The study was conducted during the months of September and October, 2018.

Results and Discussion

The supply channels of all five tanks were severely damaged. Accumulation of silt, bushes, encroachments and obstructions were found to be major is-

ues in the supply channels. The water supply to the tank was reduced drastically because of damages, encroachments and accumulation of silt. Of the five tanks, only Kolathur irrigation tank in Pallipattu Taluk of Tiruallur District under Nagariyar Sub-basin had two supply channels of which one was completely encroached. Farmers of Kolathur said that the damaged supply channel was the main supply channel which used to bring huge quantities of water during rainy season from tank's catchment area. Farmers of Mambakkam, Uthukottai Taluk in Tiruvallur district, felt guilty of themselves as they could not protect the supply channel which was connected to their irrigation tank that comes under Araniyar sub-basin.

A tank system with damaged or vanished feeder channels becomes vulnerable and within no time would become a dead system. It is, therefore, imperative for the village community and the state to protect the feeder channels and nurture the same in order for fetching water to the irrigation tank system (Sakthivadivel *et al.*, 2004). Water Resources Department, Government of Tamil Nadu (The custodian of Water Resources in Tamil Nadu) must focus on reclaiming and reviving the supply channels.

Except for one tank (Goonipalayam), water spread area of tank in all the other four villages was encroached which reduced the water storage capacity of the tank severely. The tank in Mambakkam village looked severely damaged by encroachments in water spread area. According to farmers of this village, the water storage capacity of the tank was reduced by 60% because of encroachments. "Once these Traditional irrigation tanks had the storage capacity that could serve irrigation purpose for minimum of two crop seasons in a year covering all agricultural land in the 'tank command area'", said farmers. A potential tank should be capable of storing water for a minimum of 9 months in a year; the dead storage should be there for remaining 3 months for cattle population. Farmers also reported that they could

Table 1. The list of selected villages for the purpose of the study.

Sl. No.	Name of the Village/ Irrigation Tank	River Sub-basin	Taluk in Tiruvallur District
1.	Kolathur	Nagariyar Sub-basin	Pallipattu
2.	Perumanallur	Nagariyar Sub-basin	Pallipattu
3.	Mambakkam	Araniyar Sub-basin	Uthukottai
4.	Senjiagaram	Araniyar Sub-basin	Uthukottai
5.	Goonipalayam	Araniyar Sub-basin	Uthukottai

only irrigate less than 50% of the agricultural land under 'tank command area'. Asian Development Bank (2006) conducted the study on tank irrigation in different states of India which included Tamil Nadu also. The study indicated that in 1960s the area irrigated by tanks was 38 percent but it was reduced to 18 percent. The findings of the Asian Development Bank could be seen quite evidently in Tiruvallur district where the study was carried out.

Encroachments in the water spread area of the irrigation tanks in Tiruvallur district was said to be one of the major causes of inundating the Chennai city during 2015 floods.

Tank bunds of Kolathur, Perumanallur, Goonipalayam and Senjiagaram were in good condition as Water Resources Department of Government of Tamil Nadu carried out renovation work in the recent past. But tank bund of Mambakkam was in bad shape. Tank bunds were made up of earth with simple act of engineering by our ancestors in order for preventing the runoff and storing water for serving irrigation needs of villages. Most of the tanks were built 400 to 500 years ago. It is imperative that the tank bunds are protected and strengthened further.

Condition of Surplus Weirs in all the villages looked weak. Surplus weirs were damaged during 2015 floods. Farmers reported that the surplus weirs were damaged by encroachers to release water from the tank in order for enabling themselves for carrying out their agricultural activities in the water spread area of the tank.

Sluices were severely damaged in all the tanks where the study was carried out. Farmers of Kolathur and Mambakkam reported that sluices were renovated by Water Resources Department couple of years ago. But in both the villages, the sluices were in bad shape. Farmers said that they have implemented some temporary solutions to prevent the leakage of water through sluices. Weak and damaged sluices are one of the major causes of water being stored in the tank for short duration.

Practice of Kudimaramathu could not be seen or felt in any village where the study was carried out. But farmers said that their grand parents were having practice of organizing community voluntary labour for the maintenance of irrigation tank.

The community's participation in irrigation system management was institutionalized in the name of 'Kudimaramathu.' Kudimaramathu (water governance by people) had also different titles in differ-

ent parts of Tamil Nadu. The general observation is that these traditional irrigation tanks were safe and secured as long as people had the sense of ownership. There were strong protective fencing around these irrigation tanks in the form of social control measures evolved by people themselves from time to time for protecting and safeguarding the irrigation tanks which were and are still sources of livelihood and sustainable development for people. But the present scenario is alarming. The water bodies are destroyed by the lust of the vested interest. The water bodies have been encroached by rapid industrialization and real estate boom. The time has come to reclaim the traditional water bodies through reviving the practice of Kudimaramathu, the traditional wisdom of our ancestors.

Retired Engineers of Water Resources Department (WRD) were contacted to give their observations on the issues that are prevailing at the 'Demand Side' and 'Supply Side' with specific reference to Water Resources Management; the responses are consolidated and enlisted below.

The drawbacks in the demand side management are:

- Lack of community collective ownership
- Natural apathy and individual greed over took the collective wisdom of water resource management.
- Exploiting the resource for short term gains by local people, mainly by the powerful
- Water was considered infinite without consideration for conservation and sustainability
- Limited interaction between farmers and officials of Water Resources Department resulted in the elite capturing benefits to the exclusion of the marginalized.

The drawbacks in the supply side management are:

- There is no coordination between the line departments. Mutual understanding and co-ordination amongst the public utilities at the grass roots in the water and food sector are not there.
- Lack of community mobilization skills for protection of water bodies at the grassroots.
- No effective interfacing with community
- Not reaching the unreached segments of the community at the village level

Findings and Suggestions

The storage capacity of the tanks was drastically reduced due to multiple reasons like damaged or disappeared supply channels, encroachments in the

water spread area of the tank and weak surplus weirs and sluices. Farmers estimated that the water storage capacity of the tanks was reduced by 40 to 50 percent which in turn reduced the extent of irrigated agriculture under the tank command area. Not only human population, also the cattle population is suffering due to reduced storage capacity of the irrigation tanks.

There is a pressing need to restore life with dignity for small and marginalized farmers, landless agricultural labourers and other livelihood dependants through reclaiming, rejuvenating and restoring water bodies and biodiversity resources in the villages through community participation. The deteriorating and shrinking water bodies in the villages threatening life with dignity for the poorest of the poor as their livelihood opportunities hugely depend on availability of water.

The tank is a common property which requires collective community action for remaining alive and serving irrigation and domestic water needs. Feeder channels, field channels, tank bund and structures like sluice and surplus weirs should be protected and maintained. The feeder channels and the surplus courses have to be kept clean so that they carry water in sufficient quantities to feed and dispose off the surplus water of the tank during monsoons and floods. The cleaning and desilting of channels is an annual activity that needs to be carried out before the monsoon.

Maintenance of an irrigation system is crucial for the development of sustainable agriculture.

Eliciting the participation of local communities for ensuring their involvement in water resources management has been facing challenges due to scarcity of productive labour in the villages. Many members of the productive age group have been commuting to Chennai and its suburbs since 10 years or more. Increasing job opportunities in urban centers (mainly construction sites has been a major pulling factor. Many villages in Tiruvallur District, Tamil Nadu are now facing labour scarcity for agriculture and water resources management. In this context, the Government of Tamil Nadu has to redefine its roles and responsibilities for protection of traditional irrigation tanks as the custodian of water resources in the state.

While planning tank restoration projects, the top most priority of Government of Tamil Nadu should be 'reviving and restoring feeder/supply channels'.

Farmers insisted for reviving and restoring the entire tank system in the following order of priority;

The first priority should be for reviving and restoring feeder/supply channels. (The encroachments on tank bunds, feeder channels, surplus courses and tank beds need to be evicted locally through community mobilization processes. This would ensure that the farmers have to collectively restrain themselves from indulging in free for all and vacate the encroachments for the better performance of tanks).

- De-silting tank water spread area should be taken up as it would augment water storage capacity. Every tank should be revived, its structure be recreated to its full strength.
- Tank bund should be protected and repairs should be done without any delay
- Maintenance of sluices and surplus weirs should be done at regular intervals

The core issue is governance of water resources at the bottom of the pyramid (Village level). The need of the hour is 'people's subjective and rights based participation' in governance processes of water resources at the village level, especially the youth.

The solution appears to be simple. All that we need to do is to follow the footsteps of our grand parents who did it by themselves through local institution called 'Kudimaramathu'. The Community Collaborative Water Management is an unique process based on "Integrated Water Resources Management Principles" with focus on shared vision planning and trade-offs with the sole aim of providing equitable sharing and effective utilization of the scarce water resources by all the stakeholders (World Bank, 2010).

One of the senior retired engineers says "*Community Collaborative Water Resources Management (CCWRM) is one of the sustainable alternative methods for ensuring efficient and effective water management focusing additionally on the demand side through multi-sectoral and multi-stakeholder approach.*" This is contrary to the conventional method of management viz., managing the supply side without involving the community and top down approach. He calls it Public-Public Partnership approach.

The importance of involving both men and women in the management of water including agricultural water and ensuring equitable access to and control over water resources have been overwhelmingly recognized by the international community.

There are multiple benefits when women's participation is ensured. It would ensure equitable distribution of water and social justice and empower the entire community. United National Development Programme (UNDP) emphasizes the need for gender mainstreaming as an integral part of Integrated Water Resources Management as it would augment the effectiveness of environmental sustainability, livelihood efficiency, ensure social justice and democratic water governance. UNDP advocates for recognizing the role of women in protection, operations and maintenance of micro and medium irrigation structures in order for reducing water losses and increasing water productivity (UNDP, 2014).

Young people can play active role in protecting the water bodies as in the case of Salem (one of the cities in Tamil Nadu) where youth had revived a tank which is close to the city. Engaging youth in conservation of natural resources and protection of water bodies not only creates direct impact on changing youth behaviors and attitudes, but possibly influence their parents, relatives and families. It can have ripple effects.

Protection of water bodies is directly linked with right to life with dignity, right to livelihood and right to safe drinking water. Professional Social Workers have critical role to play with below enumerated strategic interventions;

Role of Professional Social Workers

1. Community mobilization, especially youth, and building institution at the village level for water governance with inclusive and rights based approaches.
2. Sensitizing the community for claiming ownership over water bodies in the village
3. Training women, youth, children and elders to take active and rights based participation in 'water governance' at the village level
4. Organizing interfacing meetings between village people and Government water officials and managers for ensuring protection of water bodies in the village
5. Training youth on the tools and techniques pertaining to water audit and budgeting.
6. Mobilizing voluntary action for cleaning up small water bodies at the village level.
7. Enabling community to mobilize external resources which include resources from Water Resources Department of Government of Tamil Nadu and Department of Rural Development

Government of Tamil Nadu for conservation of water bodies which include marshy lands.

8. Enabling community to seek the support of judiciary (through Public Interest Litigations – PIL) for protection of water bodies
9. Developing Decision Support System (DSS) for 'diversification of crops' which would promote water and soil conservation. Crop diversification measures will also ensure more livelihood opportunities at the village level.
10. Professional social workers can play significant role for democratizing the water bodies which could be achieved through reestablishing 'community's ownership' over water bodies and ensuring community's subjective and rights based participation in governance processes of water bodies within the jurisdiction of the village. Water Governance in simple terms is 'how people take subjective and rights based participation in decision making and in executing the decisions.'
11. Kudimaramathu is symbol of 'Deepening Democracy'. Professional social workers should strive for reviving this system through strengthening the voluntary spirit at the community level.
12. Facilitate community level dialogue involving water users at the village level for evolving water conservation plan. The water conservation plan has to be evolved through dialogue with people. It should lead to community based actions for protection, operation and maintenance of water bodies.
13. Not just farmers of tank command area, also farmers of dry land agriculture, women, dalit and non-farmers should be included in the management of irrigation tank and other water bodies in the village.

Conclusion

Tamil Nadu is one of the water stressed states in India. By augmenting the water storage capacity of traditional irrigation tanks, the state can increase the availability of water from surface irrigation source and can reduce the dependency on other states for releasing water and minimize tapping ground water resources. Nurturing and protecting Traditional Irrigation Tanks in Tamil Nadu should be the priority task of each one of us. Sustainable Development Goals cannot be realized without efficient and effective

tive management of water resources. There is an emergent need for augmenting surface water potential and for reducing the exploitation of ground water resources. Surface water potential of Tamil Nadu can be augmented by increasing the storage capacity of 39200 traditional water tanks. It is high time that the Government of Tamil Nadu gives top priority for protecting and nurturing the traditional irrigation tanks involving multiple partners, most importantly community at the grassroot level. The local communities need to be mobilized with rights perspective and sense of ownership for the cause of safeguarding the Traditional Irrigation Tanks with a long-term and sustainable vision. It is high time that all of us complement with each other for this cause. We do not need to break our heads for finding out solutions for the management of Traditional Irrigation Tanks. Our ancestors had done it in the form of 'Kudimaramathu' and we simply need to adapt it with values pertaining to social justice.

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