

Will Kudimaramathu make communities “think tanks” again?

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Abstract

Like rest of Southern India, tanks in Tamil Nadu also suffered massive deterioration as irrigation moved towards being more atomistic and less community-managed. Tank institutions declined and what remained of these irrigation tanks evolved into mostly percolation tanks. In 2017, in the face of the biggest droughts affecting the state, Tamil Nadu government announced *Kudimaramathu* scheme to revive the age-old practice of community participation in tank repair and management. The program has tried to bring farmers together to form WUAs to take up activities for tank rehabilitation but like many other programs in the country, these institutions appear to exist only on paper with the program being driven primarily by local PWD officers and contractors.

This paper brings insights from thirty tanks under rehabilitation in seven districts of the state which were taken up under this scheme and were studied through case study approach. The study attempts to uncover the factors which led to better implementation in some tanks compared to others. The lessons derived from these tanks can form the basis for effective programs on tank rehabilitation in future, especially those which aim at making them participatory. The paper reinforces the need for empowering WUAs rather than just creating them, if tank management is to be made long-lasting.

Keywords: Community-Managed Tanks; Groundwater Depletion; Minor Irrigation; Tank Rehabilitation; Water User Association (WUA).

1. Introduction

Rainfall has become more uncertain in the face of climate change and droughts are frequent in the country. Over-exploited groundwater pockets have increased in number from 802 in 2009 to 1071 in 2011 and 1034 in 2013 [1, 2]. Crop failures have become rampant, seriously threatening food and livelihoods security of small and marginal farmers. The rise in farmer protests in the recent years, both in scale and frequency, is a strong indicator of declining farm incomes and productivity, especially in the face of uncertain climate. All these issues are pointing towards an urgent need for reviving local water sources, tanks or otherwise, and building capacities of farmers to plan for their water requirements.

Decline in tank irrigation and deterioration of tank-agriculture linkages is not a new story for India anymore. Tanks irrigated more than 50 per cent of agricultural lands in 1950s but now the absolute numbers on area under tank irrigation has fallen from 4.63 million ha in 1960-1961 to a mere 1.98 million ha in 2013-2014 [3]. Tanks were an important part of socio-cultural aspects of rural life and indispensable part of rural habitat; and communities maintained these tank systems over centuries to insulate themselves from recurring drought, floods, and vagaries of monsoon [4]. Although tank rehabilitation programs have come and gone in several forms in the last few decades, never before have the Chief Ministers of so many states simultaneously taken special interest in them. In 2014, as India's youngest state Telangana launched its flagship tank-revival program, Mission Kakatiya, several others jumped on the bandwagon to either restore tanks in an ad-hoc fashion or as a component of watershed development. Till date, in addition to Telangana, four other states, viz., Maharashtra, Gujarat, Rajasthan and Tamil Nadu have Chief Ministers' programs working on tanks.

2. Tanks in transit in Tamil Nadu

Tamil Nadu's 41,262 tanks have also faced the same fate as tanks in rest of the country and the state saw flow-irrigated area from tanks fall by a third, from 9,40,000 ha post-independence to 6,01,000 ha in the 1990s [5] and further down to 5,03,491 ha in 2009-2010 [6]. Historically, the state's tanks were constructed and maintained under *Mirasi* system of land tenure which established defined rules regarding repairs and water allocation and *mirasidars* (peasant proprietors who owned village land collectively but formed an exclusive body for management) had the authority and responsibility to ensure maintenance of tanks. The pre-eminence of tanks as a source of water storage and supply for multiple use was lost after independence due to a variety of factors: chiefly, the development of large-scale gravity irrigation systems, rapid spread of tube well technology, and decline in traditions of community management [4].

The total number of shallow and deep tube wells in Tamil Nadu increased by 60 per cent in less than a decade between 2006-2007 and 2013-2014 from 2,77,086 to 4,42,848 respectively [7, 8]; pointing towards the shift in preference of farmers from community managed to atomistic irrigation. In spite of the increase in number of tube wells, the total irrigated area of the state has reduced from 2.89 m ha to 2.68 m ha from 2006-2007 to 2013-2014 and continues to be less than half the cultivated area [9]. But what makes this trend raise serious concerns is the fact that in the last five years, water tables in the state have been receding steadily owing to over-extraction not matched by adequate recharge [10]. Rainfall has been highly variable in the state with total of annual rainfall showing a standard deviation of 1495 mm on the 140-year mean of 9,311 mm [11]. Also due to climate change, it is predicted that there will be

fewer rainy days in Tamil Nadu with the intensity of rain changing drastically [12]. Increasing intensity is likely to increase the chances of flooding and reduce groundwater recharge. Therefore, it is imperative to develop the capacity of the tanks to store more water. One estimate suggests that the water storage capacity of about 40,000 tanks and other small water bodies is about 17,00,000 million cubic feet which is more than the storage capacity of all dams in the State [13]. The state witnessed its worst drought in 140 years in 2017, compelling the state government to focus on harvesting water locally to drought-proof villages through participatory action through *Kudimaramathu* (translates to self-maintenance by communities) program [14].

Most initiatives taken till date to renovate the tanks without or with limited participation of farmers have miserably failed [15]. Public investment in such schemes have been low and most steps the Government has taken to intervene in their management has been in the direction of increasing its own administrative control rather than seeking to strengthen traditional local management institutions. Some of these tanks taken up under the new scheme of "*Kudimaramathu*" have already received funding under more recent programs like Central government's RRR scheme (Repair, Renovation and Restoration of Water bodies) while some were worked on under Irrigated Agriculture Modernization and Water-Bodies Restoration and Management (TN-IAMWAM) programs. Based on multitude of reports on the state's water scarcity woes, it is safe to say that none of the programs have been able to even address drinking water scarcity in the face of drought, let alone provide protective irrigation. Is the problem in these programs "doing too little too late"? Or has the new avatar of participatory tank rehabilitation taken up on Public Works Department (PWD) tanks showcased lessons for other state programs? This paper attempts to investigate the processes driving this program and draw lessons for better program design in tank rehabilitation space.

3. *Kudimaramathu* – old wine in new bottle?

During the British rule in India, total area under irrigation increased in Tamil Nadu but farmers' involvement in irrigation management declined precipitously. This was apparent to many and in an attempt to help solve maintenance problems, the British passed the ineffective Madras Compulsory Labour Act of 1938, also known as *Kudimaramath* Act, which require farmers to maintain some portions of irrigation systems, but it failed miserably [16]. Now, at an estimated cost of ₹ 1000 million, *Kudimaramathu*, in its new form, plans rejuvenation of 1519 tanks out of 16,098 PWD tanks in 30 districts in the first phase, based on the centuries-old concept of participatory water management. In the second phase, 2018-2019, 2065 tanks have been taken up with an estimated outlay of ₹ 3310 million. The scheme is designed such that the beneficiaries have to contribute 10 per cent of the allocation either in cash or by voluntary labour contribution and excavate the tanks using heavy machineries, wherever required. Every tank should be represented by a group of villagers. The program outlines water users' association (WUA) as the executing authority, many of which have become defunct [17]. In its absence, any group can go ahead and register for the scheme by depositing 10 per cent of the sanctioned amount for the works. They are also free to engage contractors. PWD officials are required to supervise the work on a daily basis, besides providing technical guidance. The main objective of the scheme is to restore full storage level in tanks and strengthen bunds. Selection of tanks for repair was done by the Department itself, many based on petitions submitted by farmers at the monthly meetings organised by District Collectors to hear their grievances [10].

Under the program, the farmers have been allowed to carry silt to their fields for the duration of the program without paying a royalty, for which Tamil Nadu Minor Minerals Concession Rule (1959) was modified suitably in April 2017. The amended rule permits persons in same or adjoining villages to carry silt and clay from tanks, channels and reservoirs without any royalty after obtaining permission from Block Revenue Officer. The limit on quantity for agricultural

land has been set at 185 m³/ha for wet lands and 222 m³/ha for dry lands once in two years, and that for domestic purposes has been set at 30 m³/ family. The quantity of clay removed for pottery should not exceed 60m³/ village.

The government of Tamil Nadu has historically always pushed participatory management in its policies. The 1920 and 1930 legislations spoke about involving people in water resources management of irrigation tanks in Panchayats, but the reluctance of the State to part with powers relating to the natural resources of tanks aborted the concept of participation. Yet again after Independence, the State government passed an order in 1975 to entrust maintenance and repair of water bodies to *ayacudars* (command area farmers) provided they obtain written consent from a majority of farmers. Later, the Tamil Nadu Farmers' Management of Irrigation Systems Act of 2000 facilitated the formation of WUAs with farmers in lawful possession of land as members. The mandate for the association was to prepare and implement an operational plan for water supply; maintain irrigation systems and regulate water use but the scheme did not succeed [18]. The WUAs established under this scheme have become defunct since because the election to revive WUAs have not been carried out. Other past programs have also tried to work through WUAs but few have succeeded and there is a prevalent notion among a section of researchers and policymakers that the present method of rehabilitating tanks and creating water users' associations is not the right way to improve the gross tank product per cubic metre of tank water; a more drastic change in thinking is required [4]. Under this scenario, the state government has introduced *Kudimaramathu* scheme without understanding the reason for failure of WUA-based interventions till date. By trying to only superficially involve communities by creating WUAs on paper, it is interesting to see if *Kudimaramathu* can differentiate itself from other programs, in Tamil Nadu, as well as other states.

4. Methodology for data collection and analysis

Thirty tanks across seven districts of Tamil Nadu (see Figure 1) were selected for the study, sampled purposively to cover tanks of different types (independent, cascade and system), different sizes of command area, demanding special focus on account of saline aquifers or drinking water scarcity, and easily accessible from data collection and evaluation perspective. Since no tendering process was adopted by PWD and each tank selected contractors by its own unique processes, case study approach was used to derive a set of rules and regulations used during the implementation and the consequences of such rules and regulations.

Each tank was visited a minimum of two times. The first visit was to understand the status of tank and gather data on other relevant village indicators from the local administrative officer. It helped identify various coping mechanisms adopted by farmers and how tank status played a role in meeting /not meeting their objectives before the start of the rejuvenation program. If farmers did participate in the program, the researchers tried to understand in subsequent visits the motivation of farmers to co-operate and if the tank rejuvenation was demand driven project or thrust upon by any agency or influential people in the village. Secondary data was also collected online through government databases on the tanks' watershed delineation, rainfall and runoff and surrounding groundwater tables.

Evaluating success or failure of a program like *Kudimaramathu* is not simple given the lack of standard parameters that can be measured, especially so early into the program. Therefore, a set of twenty indicators were identified to measure perceived success of the program and a subjective score on 5-point scale was arrived on by the researcher upon discussing with farmers focus groups. The twenty indicators can be grouped into following categories:

- *Processes Employed*: This category measured variables such as contractor selection, arrangement of funds and monitoring during the process.

- *Quality and Quantity of work:* This parameter included indicators such as proposed work vs. actually done, quality of silt, extent of removal of *Prosopis Juliflora*, stone pitching of bund and strength of bund after the program, timely completion of work and full utilisation of estimated cost.
- *Participation of stakeholders:* This included three indicators, namely, community involvement in planning, farmers' participation in actual work done and farmers' suggestions acknowledged and included in processes and rejuvenation work.

- *Early Effects of the Program:* This category tried to measure the perceived benefits of rejuvenation by scoring on indicators including utility and relevance of the scheme, improvement in storage, utility of tank bund, changes in groundwater condition, improvement in drinking water quality and livelihood diversification.

Each of the thirty tanks were evaluated based on these parameters to identify successful examples of implementation as well as failed attempts to chalk out lessons for success.

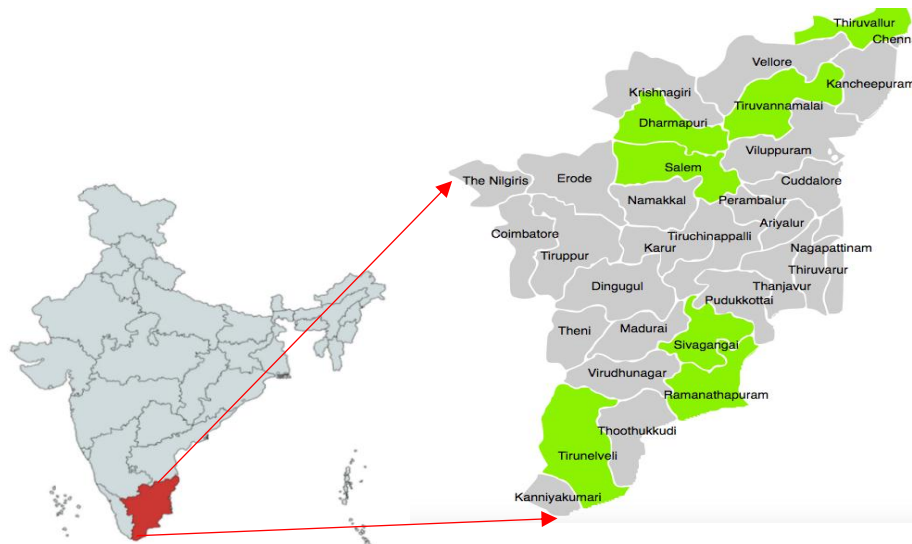


Fig. 1: Map of India Showing Tamil Nadu (Left) and Districts Selected for the Study Highlighted in Green (Right).

5. Discussion of study results

5.1. Processes employed

Tank Selection: The process adopted for tank selection is not very clear. From various published reports and news items, it is surmised that farmers of respective district during monthly grievance hearing meetings convened by respective District Collector express their grievances and ask for certain type of repair and reconstruction measures to overcome the deficiency. The Engineering Chief (EC) is asked by the Secretary of Water Resources to prepare a list of tanks for rejuvenation from among the PWD tanks under *Kudimaramathu* scheme. The EC in turn requests the three Regional Chief Engineers (RCE) to prepare a list of tanks needing rejuvenation who turn to their field officers. The field officers use their judgement based on tank conditions and also take into account the pressure brought by the bigwigs and local political functionaries. Each RCE, through his/her field officials prepare a list of tanks to be undertaken with tentative cost for taking up the rehabilitation and pass it on up the ladder. The list received from the RCEs is discussed with the Secretary and the Ministers concerned and tanks to be selected for rejuvenation under *Kudimaramathu* is finalized keeping in mind representation from most of the tank districts. So, it is clear that tank selection is neither need-based nor demand-driven.

WUA formation and Contractor Selection: The local section officers (Assistant Engineers) of PWD have a fair idea about tank statuses and about local contractors, their performance, and political clout surrounding them - including possible farmer and farmer groups capable of taking contract and implementing it successfully. S/He informally discusses with the prospective candidates and arrive at a decision as to who should be given the contract. Using the contractor as a vehicle to put the project on ground, s/he then convenes a farmers' meeting to form WUA, selects office bearers of WUA and confirms the selection of contractor through WUA. The WUA is used as a dummy to satisfy the program requirement. In most of the tanks studied, it was found that there is no real participation of WUAs in decision making and in implementing the rejuvenation scheme. Once the contract is given to a contractor, he

forgets about the WUA and operates as per instructions of the local engineer who is central to clearing bills and sanctioning payments. Hence, there is a close connivance between the contractor and the local PWD official in the amount of work executed, and the quality of work done, while the WUA is left entirely out of the process in most cases.

5.2. Quality and quantity of work

Removal of *Prosopis Juliflora*: *Prosopis Juliflora* is one the most evasive weeds in the tanks of Tamil Nadu and has sounded death knell for a large number of tanks by increasing evapotranspiration and obstructing groundwater recharge. As problematic it may be for command area farmers around the tank, the landless labourers derive their livelihoods from it by selling wood or making charcoal [19]. The contractor who takes up the work of cleaning the tank bed can employ machines along with human labour to remove the bushes and bigger sized plants from the tank bed and bund, and allow the locals to use the wood while smaller parts of the tress such as sticks are burnt within tank beds. The second option available to the contractor is to give a sub-contract to a person/ group to remove the trees and bushes and use the cut wood in whatever way they deem fit. The third option is to cut the plants and make it charcoal out of it, which is economically attractive but requires specialized skills. In most of the tanks visited for the study, clearing of bushes had been undertaken by the main contractor himself, both in the bed and bund. Only in couple of cases, weed removal had been limited to tank bund due to paucity of funds.

Strengthening and Increasing Bund Height: This component is invariably included in all rejuvenation works undertaken. The reason for including this component has not been clearly spelt out in the project document prepared by PWD. The dimension of width, height and side slopes are specified and, in some tanks, and they are marked on the tank bund by PWD officials using pegs. Contractors or their agents monitor dumping of earth, levelling and sectioning of the slopes. But in none of the tanks visited, was soil testing done to check moisture levels. The silt excavated from tanks are used for bund strengthening and PWD has also provided guidelines to extract silt 10-15 m inwards from foot of the bund. This criterion has been by and large adhered to but the criteria itself does not have a

strong technical backing. In cases where *moorum* was found in the tank beds, soil was taken from elsewhere to strengthen the bunds. The haphazard way of de-silting based on “loose” guidelines and using sub-standard material for bund formation questions the longevity of work done. Also, because the excavation across tank beds is irregularly shaped and also vary widely in depth and larger surface area is exposed to evaporation. Most farmers found quality of work done on bunds satisfactory and the average score on this indicator was 3.5 out of 5 for 30 tanks studied. However, many farmers felt that since bund height was increased without increasing height of surplus weir, it is not going to make much change in storage capacity of the tanks.

Silt transportation: Farmers are selective about transporting tank silt to their fields mainly because they generally limit to one crop a year in tank command (which is mostly paddy) and as the tank command area is mostly clayey, it makes little sense for them to add another layer of clay loam from tank bed. Farmers who practice mostly rain-fed agriculture are interested in applying silt to improve yield and preserve moisture. But rain-fed farming is mostly subsistence in the region and carrying silt involved substantial cost which discourages even those farmers from lifting silt. Thus, even with the government lifting royalty on stipulated silt quantity, farmers have not been very enthused. So, most of the silt excavated have been used on tank bunds only. Since there are no guidelines on quantity of silt to be extracted, the WUAs or contractors or the Department cannot plan what to do with excess silt. The effort that has gone in estimating the type, quantum and location of silt within the tank bed is woefully inadequate. With proper planning, the silt can be sold-off for construction and money raised can be used by the WUA for future maintenance of the tanks.

5.3. Participation of Stakeholders

Tamil Nadu’s policy has been pro-participation for quite some time as has been explained in the earlier sections. Government officials

have been uniformly keen on re-establishing their version of *Kudimaramathu* for maintenance which is considered a government responsibility. In 1963, the government issued an order introducing a 60:40 sharing of maintenance costs by the government and farmers, respectively. In 1974, it further reduced farmers’ contribution, but it has not significantly increased farmers’ participation in maintenance. Further orders issued in 1976 state that *Kudimaramathu* works should be carried out by Panchayat union and the costs be recovered from the farmers. But none of these attempts by the government to mobilize farmers or farmer resources for maintenance have worked. As mentioned earlier, WUAs were formed in the past but have been rendered defunct owing to dwindling interests of farmers in participatory irrigation. But with steep groundwater decline in major hard-rock areas, the farmers might not have an option but to focus on collective action to harvest rainwater and recharge groundwater. Programs like *Kudimaramathu* should leverage the current status of groundwater and drought to revive WUAs and tank groups.

Sakhivadivel *et al.* [4] studied high performing tank institutions and noted that for any group to function in long-term there should be mechanism to ensure water acquisition (by cleaning of feeder channels or connecting the tanks to a river nearby), water allocation/ distribution, and sources of funds (such as by selling fishing rights, usufructs, fines and fees from members etc.). This scheme has not focussed on any of these aspects and a one-shot attempt like this with barely any powers vested in WUAs to make decisions now or in future is not likely to make them spring back to life suddenly. The tanks where farmers reported participation to some extent also reported overall high composite score i.e. best implementation examples of this program have higher level of participation, with correlation between the two being very high (76 per cent). Figure 2 shows the comparison between the two scores.

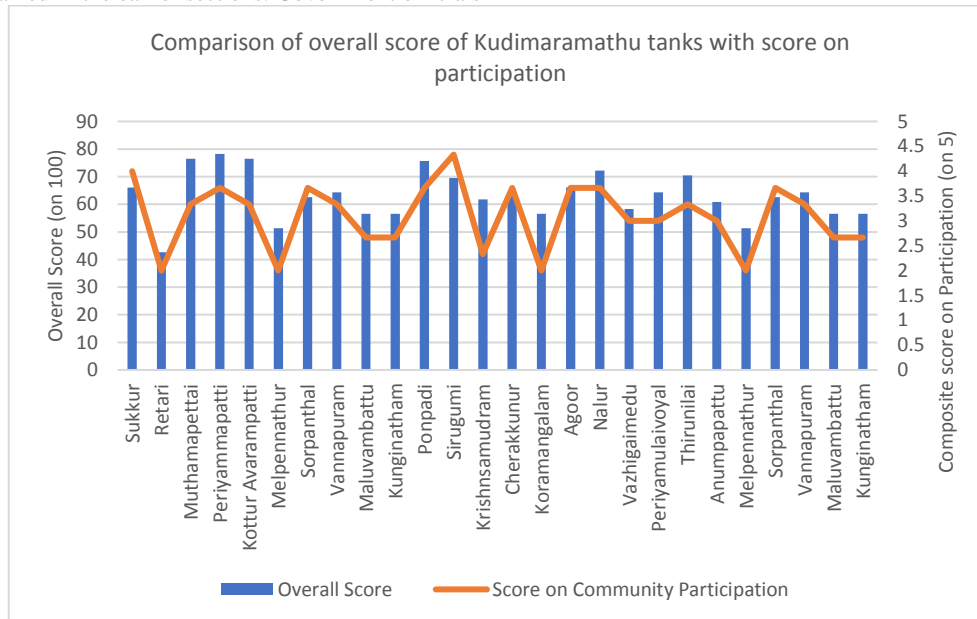


Fig. 2: Ascertaining Importance of Participation in Overall Success of the Scheme.

5.4. Early effects of the program

Data was collected in the immediate aftermath of Retreating Monsoon and Northeast Monsoon with farmers being able to observe and anticipate some early effects of the work done. Most of the districts in Tamil Nadu received less rainfall than normal in 2018 (Source: IMD), yet farmers were hopeful that the program will at least improve the drinking water quality in the area, with average score for the variable being 3.54. The scores, however, are not strongly correlated with the overall score of tanks with some lesser “successful” implementations also reporting higher scores on effects. Most farmers were of the opinion that the volume of silt

extracted is not sufficient to meet irrigation needs but there is a glimmer of hope in the minds of poor and marginal farmers that this scheme would provide at least additional water to recharge their drinking water wells. So, it appears that this program is a silver lining for the farmers, but the true impacts are yet to be ascertained and it is too soon to tell.

6. Lessons learnt

Tank rehabilitation programs taken up in mission-mode has become a fad in the present day with Chief Ministers not only investing huge

amount of money and resources but also associating themselves very closely with them. It is almost as though they are banking on the success of these programs for securing another term. Media and researchers also have been invested in finding ground realities and reporting “impacts” of these programs very actively. Shah *et al.* [20] studied Telangana’s flagship Mission Kakatiya and reported that the work planning process was unduly focussed on civil works such as bund strengthening rather than provisioning for long-lasting institutions and sustainability. They also seriously questioned the lack of hydrogeological assessment to ensure groundwater recharge. With more and more irrigation tanks being converted to percolation tanks as farmers’ preference for groundwater irrigation only continues to increase, it is likely that tanks which do not offer direct economic and livelihoods benefits, will end up dilapidated once the programs end. *Kudimaramathu* seems no different in that regard. Nonetheless, the program was able to showcase a few good examples of implementation based on which some lessons can be drawn. We list some of those best practices below:

- If rejuvenation of tank under *Kudimaramathu* scheme is implemented in a village where the components of the scheme truly address the existing crisis and the need of the village, then there is every chance that the scheme will be successful. In other words, the scheme should be a demand-driven one and not pushed for the sake of completion. An example of such a successful demand-driven implementation is Kombai-pallam Tank in Dharmapuri District where a pre-existing WUA decided to add on to the desilting work already taken up under MNRREGS and IAMWARM and planned to spend the sanctioned ₹ 2.2 million on stone pitching of bunds to control repeated encroachments. This is also an example of efficient fund utilisation through participatory planning in cases where multiple programs exist, and integration can be effective.
- Faith of farmers in the integrity and fairness of the leader or group taking up the exercise is an important attribute for the success of the scheme. For example, in Radhanur and Madhavanur Tanks in Ramanathapuram District, the president of WUA, who was also a wealthy farmer in the village, convened a village meeting, created awareness about the program and took up the contract as a group to extend a feeder channel by 4 km and clean the channels instead of desilting, as was their need. Other farmers donated their labour and took the implementation to completion.
- The transparency in activities of WUAs, collective decision making, forming clear cut rules and strict enforcement is an important attribute for sound implementation and proper functioning of the system as observed in Periyamma Patti Tank in Dindugal District, the tank with highest composite score of 78.2 per cent. In this particular tank, the farmers’ association took up the task of WUA formation, obtained necessary permission for silt transportation from local administrative office, collected ₹ 500-700 per acre from all command area farmers and revived the role of *Neerapaichi* (traditional water manager) to ensure fair water distribution.
- Systems with WUA president having sufficient powers to reprimand were implemented in a satisfactory manner as seen in the case of Muthanampatti Tank in Dindugal District as the president cut down the water supply to the head end farmers when they had opened the head sluice out of turn and only allowed water to them after the whole villagers pleaded for forgiveness on behalf of the head enders. This also implies that WUAs who can make decision about contractor selection and rates will be able to get better quality work done.
- A strong financial base of WUA and its ability to mobilize resource is an important attribute for the success of *Kudimaramathu* scheme. For example, in Sakkur Tank in Sivagangai District, where the WUA existing for 20 years had been able to build a corpus of ₹ 1,80,000 which they used to supplement *Kudimaramathu* work and repair sluice gate.
- The role played by an NGO or an individual with commitment to contribute for the success of *Kudimaramathu* scheme

was found to be vital. For example, in Mookan Eri in Salem District was rejuvenated by an NGO (Salem Citizen’s Forum headed by Piyush Manush). The NGO acted as a facilitator to build an implementing team which was trained to become the engine to drive the program. The 100-day workforce under MGNREGS was roped in to maintain the supply channel and therefore, the durability of works put in place is very high. The NGO also pulled in some CSR funds to provide agriculture extension services.

- Where there are non-farm activities heavily dependent on water and tank silt such as brick making and livestock rearing, the *Kudimaramathu* scheme was a successful one as seen in Kottur Avarampatti Tank in Dindugal District.
- Providing boundary stone has helped the villages identify the encroachers and using social pressure to evict them. Farmers also feel that demarcation of government lands by boundary stone will prevent future encroachment and takes care of long-term sustainability. The average score provided for this indicator was 3 indicating that farmers expect this particular component to be completed with better quality.
- Where there was regular monitoring and technical inputs from the PWD officials, *Kudimaramathu* work was done in a satisfactory manner. PWD officials did provide technical specifications in most cases but without their constant monitoring, contractors are bound to slack off or compromise on the work, especially when WUAs are not empowered to make decisions about contracting.
- Three types of contractors were found being employed amongst the study tanks. The first type is a prominent person in the village taking the contract, second is a group of farmers forming a WUA together to take the contract and third is a contractor from outside the village who has done similar work in some other tank. Based on comparison of Radhanur Tank (led by a prominent person), Madhavanur Tank (led by a group of farmers) and Poothondi Tank (assigned to external contractor) in Ramanathapuram District, amongst others, it can be observed easily that the work done by farmer group as a WUA stands first in terms of quality and quantity followed by cases when a prominent person acts as the contractor and the last by the contractor from outside the village.

7. Concluding remarks

Ownership of tanks by departments whose core area of focus is public construction appears problematic in itself because if there is one key takeaway to derive from decades of research on tanks is that they are only as good as the institutions supporting them. Maintaining tanks from the purview of physical renovation is not likely to bring a lasting impact on reviving its role in the lives of tank users. And the new trend of using regular departmental budget for deferred maintenance of tanks and promoting them as big programs is anything but building the right picture of minor irrigation revival. In several tanks studied, farmers reported having submitted multiple requests for repairing one or more tank components, which were due for long. Some of their requests were taken up under the banner of *Kudimaramathu* program.

Water acquisition is one of the most important factors for success of tank operations [4] and this scheme has worked on that aspect partially by increasing capacity and repairing bunds but the other factors which are equally important have been completely ignored. In some tanks, WUAs empowered by local leaders, NGOs or achieved through synergies with older programs (like IAWARM) have driven this program to success. Given the design of the program, WUAs are supposed to be integral to it but the way it has been implemented, WUAs have been pushed to the side-lines with no real role to play. This sends an important message towards integration of programs, not only between departments but also with programs of NGOs and local bodies. If an earlier program would have focused solely on empowering tank groups, *Kudimaramathu* would have succeeded well in all tanks and longevity of civil works

and institutions would have been ensured. And, it cannot be reemphasized enough that the focus of NGOs and government should be on strengthening and empowering WUAs to take up such tasks themselves and not just in creating and forgetting their existence.

Kudimaramathu can also learn from other state programs which have been implemented in mission-mode but through different models. Where tank groups function, provisioning for excavators and earth-movers on rent by departments like PWD can let farmers take a call on what works do they actually need and when. Departments should continue to provide technical support but let farmer-led institutions make decisions collectively for all tank beneficiaries. Stopping or reversing the decline in tank systems and in village level organisations will require changes in the state's irrigation policy. One recommended change would be recognition of community rights in land and water, including groundwater instead of state control that currently exists in law. With climate change and increasing uncertainty of rains, farmers would fare better by taking control of their water resources' planning, budgeting and distribution. Additionally, local governments made responsible and accountable for management of irrigation and water resources are more likely to extend their benefits over a large segment of the local population, being subject to local pressure and ensure sustainable and equitable benefit-sharing.

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