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# Eroding Community Norms and Tank Irrigation under State Entitlements

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## ABSTRACT

Drawing insights from a case study of an agrarian tribal community—the Kurichiyan—from South India, we find that tank irrigation, which was once sustained by strong community norms, a kinship organization that upheld individual subsistence entitlements from jointly held private property and the tribal community's understandings of local social ecology, is now on the wane. The state entitlements channelled through decentralized development interventions that promote individual citizen's entitlements have unintendedly undermined community norms and tank irrigation.



**Keywords:** Decentralized development initiatives, Individual citizen's entitlements, Social transformations, Ecological wisdom, Livelihood, Sustainability of tank irrigation


## 1. INTRODUCTION

The once apparently simple and sustainable social–ecological system of collective tank irrigation has now become rather complex, and it requires careful diagnosis of the social, economic and political settings and related ecosystems (McGinnis & Ostrom, 2014; Ostrom, 2009). Policy interventions to sustain indigenous groups' common resource endowments are not a priority for most nation-states. Nevertheless, the issue of water sustainability is critical across the globe. In this context, the state entitlements channelled through decentralized and participatory development interventions in India offer new analytical insights. Traditional community norms and ecological wisdom vis-à-vis state entitlements as part of development interventions add to the complexity in sustaining collective tank irrigation. An attempt has been made here to show this through a case study of the Kurichiyan tribe in Kottathara Panchayat located in Wayanad District of Kerala State in India. The Kurichiyans are known for their large, traditional matrilineal joint family system and ecological adaptabilities. Existing anthropological understanding (Aiyappan & Mahadevan, 1990) and macro development indices of Kerala indicate that the Kurichiyans, predominantly an agrarian tribal community in South India, are one of the relatively developed tribes in the state (Government of Kerala, 2013).

Today, there is a marked tendency among the Kurichiyan youth to break away from joint family living and common agrarian livelihood. Private and modernized irrigation systems are becoming popular among them, which show a total neglect of their traditional ecological wisdom and knowledge of natural landscape (Menon 2012). There is also growing eagerness among them to explore new livelihood options, taking advantage of state entitlements. Divergence in household goals and joint family goals are also clearly emerging in this agrarian tribe. Our analysis of the

changing community norms and resource endowments of the tribe shows a fundamental shift in their community set-up, which is, in all likelihood, irreversible.

Ian Scoones notes "[a] certain complacency, fuelled by generous funding flows, a comfortable localism and organisational inertia" (Scoones, 2009, p. 191), which he interprets as a non-addressal of some of the big, emerging issues of rapid globalization, disruptive environmental change and fundamental shifts in rural economies. Several studies, on the other hand, highlight how decentralized and participatory community-based interventions shape communities, their common resources and their management (Fischer et al., 2014; Jagger et al., 2018; Meinzen-Dick, 2007; Persha et al., 2011). How the relationship between communities and various state actors impact decentralized initiatives is also a subject-matter of detailed analysis (Lund & Saito-Jensen, 2013; Ribot et al., 2006; Ricks, 2016).

Like in many countries of the world (Gorriz et al., 1995; Kumnerdpet & Sinclai, 2011; Ricks, 2016), India has also made attempts to achieve water sustainability by rehabilitating the declining community managed irrigation systems through a process of revival and creation of new institutional arrangements (Aubriot & Prabhakar, 2011; Meinzen-Dick, 2007; Reddy & Reddy, 2005). However, such decentralized and participatory interventions of the State simultaneously promote individual entitlements and contradicts the goal of community participation by unwittingly undermining community norms and nullifying or minimizing the conducive conditions for sustainability of common resource endowments.

In this study, we try to illuminate yet another side of this relationship between decentralized development interventions and community norms, that is, how State entitlements impact community norms and common property resources, especially in an indigenous agrarian tribal context, which happens largely due to State entitlements to individual beneficiaries. These include "massive social-sector investments, radical agrarian reforms and welfare programmes" (Kjosavik & Shanmugaratnam, 2011, p. 231) and follows a rights-based approach to livelihood development (Conway et al., 2002). In fact, these interventions may further be augmented, given the indigenous community's own enchantment with mainstream development notions. New development situations could make the communities, specifically indigenous communities, vulnerable or cause them further disadvantage. This situation has been debated in the literature on Kerala (Kjosavik & Shanmugaratnam, 2006, 2011; Nair, 2014; Sreekumar & Parayi, 2006; Steur, 2009) as well as elsewhere (Duncan, 2007; Ehrentraut, 2011). We attempt to further this debate by providing empirical evidence based on the analysis of the Kurichiyans' tank irrigation.

## 2. BACKGROUND

The importance of tank irrigation in South India's agricultural scenario is well noticed because of its fit with the local social ecology (Ratnaval & Gomathinayagam, 2006; Vaidyanathan, 2001) and the provision of multiple functions (Palanisami & Meinzen-Dick, 2001; Venkatachalam & Balooni, 2018a). However, the appreciation of tank irrigation has declined in the last few decades, owing to the decline in collective management and overdependence on groundwater extraction for irrigation (Kajisa et al., 2007; Palanisami et al., 2010; Reddy et al., 2018), posing challenges to water sustainability. The number of tanks not in use in India has doubled between 2001–01 and 2010–11 and the share of tank irrigation to total irrigation in India has declined from 17% to 2.5% between 1950–51 and 2014–15 (Reddy et al., 2018). Over the years, due to increased water scarcity and consequent conflicts and contests over surface and groundwater rights, accentuated by water supply being perceived as a state responsibility and a governance issue, there is a renewed interest on water storage initiatives including rejuvenation and building of tanks in South India, as elsewhere in India (Aubriot & Prabhakar, 2011; Palanisami et al., 2010; Venkatachalam & Balooni, 2018b).

In the development discourses of water resources management, governance and policy in India (Ballabh, 2008; England, 2018; Government of India, 2012, 2016), with some exceptions (Phansalkar & Verma, 2004; Sainath, 1996),[1] the socio-ecological reality of the tribal or indigenous peoples' lives and livelihoods is largely untouched. Even the discourses on water scarcity have emerged as a meta-narrative that ignores anthropogenic dimensions (Mehta, 2007). Besides, the notion of inclusive development is applied only in extending benefits of development initiatives to tribal regions and ensuring the tribal people's participation in development programmes—as in case of Indian government's rural job scheme (Mahatma Gandhi National Rural Employment Guarantee Act—MGNREGA)—and formulated on the basis of lessons learnt from mainstream socio-economic and ecological realities. Being co-opted into the mainstream development initiatives, the tribal people's development aspirations become increasingly moulded after mainstream aspirations and valuations (Menon 2012) that cause them to drift away from their traditional ecological wisdom, as is the case with the Kurichiyans.

Wayanad District, the Kurichiyan homeland, is predominantly a highland region of tropical climatic conditions with dense vegetation, marshy lands (known locally as *kollies*) and diverse flora. Many of these lands are protected by locals as sacred groves. The region is contiguous to the

[1] Well-known NGOs in India like Pradan (http://www.pradan.net/) and NM Sadguru Water and Development Foundation (http://www.nmsadguru.org/) are working in the tribal regions of India to have successfully built up local water resources considering tribal lives and livelihoods.

Western Ghats, a World Heritage Site. Tanks in the Wayanad region are typical water storage structures, developed in relation to the local ecology and climatic conditions, and are situated at the foothills of the hillocks and marshy lands that house diverse flora with water retention properties. Taking advantage of the typical landscape and their own traditional ecological wisdom, the Kurichiyans achieved sustainable livelihood by developing a tank irrigation-based agriculture system using local material. However, internally propelled social transformations, such as breaking away from joint family system, as well as state laws, such as outlawing matrilineal family inheritance (Arunima, 2003; Saradamoni, 1999) and development initiatives, such as housing benefits, have unintendedly made a dent on their community norms.

Development initiatives by the state with regard to tank irrigation—for instance, providing financial support for reinforcing tank boundaries to make them permanent structures as well as for their maintenance and in developing water storage infrastructure on private lands—are altering the traditional ecological wisdom of the Kurichiyans and their cultural norms. However, due to the lack of sustained state support for repair and maintenance of permanent tanks, added by the loss of family labour on account of the changes in the joint family system, the tank-based agriculture of the tribe has waned. Moreover, the sustainability of the tank irrigation system has also been challenged, because the ownership and management of tanks have become ambiguous in the changed scenario, a dynamics that calls for necessary correctives to development policy initiatives that ignore local social ecology and cultural norms.

## 3. METHODOLOGY

Kottathara Panchayat, the study region where the main source of irrigation is tanks, has two types of land: the low-lying land known as *vayal*, used for paddy and banana cultivation which depends on irrigation, and the upland known as *kara*, used for perennial plantation such as coffee, areca nut, coco and other agricultural intercrops in the coffee plantations. The panchayat is home to 15 Kurchiyan joint families (Table 1), each collectively owning large tracts of agricultural land and three of them owning more than one tank (Table 2). Tank management and agriculture are strongly linked to their joint family systems and associated cultural norms. Before becoming settled agriculturalists, the Kurichiyans practised shifting cultivation and cattle rearing. With the forest becoming State property during the colonial era, the loss of grazing land made an impact on their integrated farming and associated cultural norms.

We studied all the 15 joint families constituting the entire population of the Kurichiyan tribe of Kottathara Panchayat. A structured and pre-tested questionnaire was administrated to all the 15 joint families to collect information on their family structures, land holdings, cropping patterns,

irrigation methods and their contribution and participation in tank management. The heads of joint families—*Karnavars*—who are customarily in charge of tanks were interviewed for collecting information on their tank management practices, problems encountered, the role of the state and panchayat, and new institutions of labour deployment. Information were also collected on water availability in the tanks and their structural maintenance as well as the surrounding ecology like marshy land, sacred groves and conservation of flora.

The primary data collected from these sources were validated through probing interviews at a workshop which was attended by researchers, joint family heads and other representatives from the joint families. This was in addition to the secondary data collected from written records of the Kurichiyan joint families and relevant government agencies such as Kottathara Panchayat office, the Krishi Bhawan (a decentralized agriculture office in the panchayat) and the state minor irrigation department.

## 4. RESULTS

Community ownership of land has gradually eroded in Kottathara Panchayat. Out of the 15 joint families, nine have partitioned their land over the years. While five joint families have partitioned their land de jure, de facto partitioning has happened in the case of six joint families. Both the largest joint family (JF-9), with 16 households with a total of 79 members, and the smallest joint family (JF-7), with four households with a total of 21 family members, come under this category (Table 1). In the case of the joint families that have opted to be de facto partitioned but not de jure, it is the transaction costs that have deterred them from de jure partition. With each nuclear family coming into being, there is greater exploration into the possibility of tapping developmental and livelihood assistance from the state, including sometimes the creation of new tanks. In the case of both the de jure partitioned and de facto partitioned joint families, there is great reliance on state funds, provided they come without legal encumbrances.

**Table 1: Number of Households within Kurichiyan Joint Families (JF) and Number of Members within a Household (H) in Kottathara Gram Panchayat**

| | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | H11 | H12 | H13 | H14 | H15 | H16 | Total members |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JF-1 Anerimuttil | 10 | 10 | 3 | 6 | 10 | 7 | | | | | | | | | | | 46 |
| JF-2 Aneri Mukkoth | 6 | 5 | 12 | 4 | 9 | 23 | 10 | 5 | 4 | 5 | | | | | | | 84 |
| JF-3 Attikkal | 3 | 3 | 4 | 6 | 4 | 3 | 3 | 3 | 9 | | | | | | | | 38 |
| JF-4 Maravayal | 5 | 5 | 5 | 4 | 5 | 6 | 6 | 4 | 5 | 7 | 4 | 7 | 10 | 4 | | | 77 |
| JF-5 T. Maravayal | 7 | 4 | 4 | 5 | 4 | | | | | | | | | | | | 24 |
| JF-6 Poolakkolli | 3 | 4 | 4 | 6 | 8 | 4 | 8 | 5 | 4 | 5 | 7 | 6 | 9 | 9 | | | 82 |
| JF-7 Thengakkolli | 8 | 5 | 4 | 4 | | | | | | | | | | | | | 21 |
| JF-8 Malakkottur | 5 | 7 | 5 | 7 | 4 | | | | | | | | | | | | 28 |
| JF-9 Kappumkolli | 12 | 6 | 6 | 5 | 5 | 4 | 4 | 5 | 3 | 5 | 5 | 5 | 4 | 4 | 4 | 2 | 79 |
| JF-10 ThazhaeAneri | 2 | 5 | 4 | 5 | 5 | 7 | 5 | 8 | 4 | 8 | | | | | | | 53 |
| JF-11 Vayppai | 5 | 5 | 5 | 5 | 5 | 2 | | | | | | | | | | | 27 |
| JF-12 Neerchaal | 6 | 1 | 6 | 7 | 8 | 4 | 3 | 5 | 5 | 7 | 4 | | | | | | 56 |
| JF-13 Chundramkode | 10 | 4 | 9 | 6 | 5 | 6 | 4 | | | | | | | | | | 44 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JF-14 Karimkutty | 6 | 4 | 5 | 5 | 4 | 4 | 2 | 4 | 5 | | | 39 |
| JF-15 Palukkappu | 4 | 4 | 3 | 3 | 5 | 2 | 4 | 4 | 4 | 4 | | 37 |

Source: Compiled by authors.

Even when the families use state funds for the repair and maintenance of tanks, they consider it under their joint family ownership as they pay land taxes, despite some of the non-Kurichiyan panchayat members considering them as public property due to the fact that state development funds have been invested in them. Since the majority of the population in this panchayat is Kurichiyan, the issue of whether the state sustained tanks are public or community owned has not been a relevant issue causing any discussion or concern, especially in the context of Kurichiyan joint families breaking down and needing external assistance in labour or resources to sustain the tanks. We find that all the three relatively well maintained tanks belong to the joint families who have partitioned their land (JF-1, JF-9, JF-12), as opposed to not so well-maintained tanks of the six un-partitioned joint families (Table 2).

**Table 2: Changing Features of Kuruchiyan Joint Family Tanks in Kottathara Gram Panchayat**

| Joint family (JF) | Status of land ownership | Field observations |
|---|---|---|
| JF-1[a] | De jure partitioned | |
| (i) | | Tank, once solely used for irrigation, is now a multi-purpose tank used for swimming, bathing and aquaculture besides irrigation. Well maintained tank with good marshy land around it. Once collectively managed by the joint family, it is now collectively managed by the trust after family partition. |
| (ii) | | Leakage of water from the tank, a minor problem, is managed by one household within the trust. |
| JF-2 | Unpartitioned | Canal system, hardly visible now due to plant growth and silt deposit in the tank, is not attended to by the joint family. A major state-run irrigation project's canal going through the area and ongoing land partition conflict demotivate the joint family from self-maintaining this tank or tapping panchayat resources for its upkeep. |
| JF-3 | De jure partitioned | The tank, amidst the upland paddy field, is defunct with heavy siltation. The joint family members gradually are moving out of the area and are disinterested in maintaining this tank because a non-governmental organization, under a state-sponsored Brahmagiri watershed development scheme and in association with the panchayat, has dug a new tank in low-lying area. This canal irrigation is now preferred along with the mainstream cash cropping pattern which is water intensive cropping. |
| JF-4 | De facto partition but not de jure | Major problem is waterweeds growth. Siltation of tank, leakage of water and collapsing of sidewalls are minor problems. |
| JF-5 | Unpartitioned | Major problem is waterweeds growth. Siltation of tank, leakage of water and collapsing of sidewalls are minor problems. |
| JF-6[a] | De facto partition but not de jure | |
| (i) | | This tank, located amidst paddy field, is covered with silt; the reinforcing walls are dilapidated. |
| (ii) | | Located in the low-lying area, it has water leakage problem due to its faulty design and wrong site selection, obvious failures in the state development intervention. |
| JF-7 | De facto partition but not de jure | The joint family continues to maintain the marshy land. The panchayat initiative in a tank construction remains suspended. |
| JF-8 | | The tank is destroyed by a new road, but this joint family continues to draw water from the marshy land. |

| | | |
|---|---|---|
| JF-9 | De facto partition but not de jure | Best managed tank, ideally located and well maintained, still continues to be so with the panchayat desilting, as one family member employed in the panchayat uses her access to information about panchayat schemes and contacts well. |
| JF-10 | Unpartitioned | The marshy land was the main source of irrigation once. The panchayat had desilted and reinforced this natural tank. However, it is now in a dilapidated state, but is still used for household purposes and irrigation. |
| JF-11 | Unpartitioned | Tank was originally constructed only due to availability of state funds and not because land was ecologically suitable. The tank was built where no marshy land existed. It was built on because state funds would have lapsed due to non-utilization. |
| JF-12 | De facto partition but not de jure | A naturally recharging tank in an ideal marshy land was destroyed by a newly constructed road. Water from the marshy land is now collected in a new water storage tank, in good condition, but far inferior and its sustainability is dependent on rainfall. |
| JF-13 | | Major problems are siltation and leakage of water. |
| JF-14 | De jure partitioned | Dependent on an upland and distant marshy land surrounded by agricultural lands of other families who cultivate water intensive cash crops like banana. This cropping and irrigating pattern impacts the marshy land. This marshy land is also additional source of irrigation for JF-15. |
| JF-15[a] | Unpartitioned | This tank, reconstructed by the irrigation department, has lost its natural water recharging capacity and is largely a rainwater storage tank. Under Brahmagiri watershed development scheme, the sides of the tank were reinforced and the canal system was reconstructed. This joint family, very resourceful, continues its agricultural livelihood but expects the state to maintain the tank. |

Source: Compiled by authors.

The Kurichiyan community norms regarding jointly held common property has changed considerably in recent years. Parts of the common land that were traditionally set apart as trust land (*kunjukuttiswathu*—literally meaning childern's property), used either for the maintenance of common responsibilities towards children, invalids, orphaned, widowed, and so on, or for common ritual purposes, have declined considerably. Instead, a new notion of trust land using legal provisions of contractual law has emerged to ensure individual ownership rights not sanctioned according to cultural norms. Traditional Kurichiyan norms held that jointly held property entitlement is based on matrilineal inheritance. According to this principle, the children of a joint family head's sisters, who were raised in the matrilineal joint family under the care of maternal uncles and worked in their jointly held agricultural lands, could not claim the property or proceeds to be bequeathed to their children upon adulthood. Towards the beginning of the 20th century, matrilineal inheritance started to wane and was completely abolished in December 1976, when the

Kerala Government promulgated the Kerala Joint Hindu Family System (Abolition) Act (Jeffrey 2006).

The break-up of the joint family system is internally propelled by social transformations happening within the Kurichiyans, not only because of the outlawing of the matrilineal system but also due to the economic aspects associated with it. The nephews providing labour to a joint family do not have ownership rights unless one marries his maternal uncle's daughter having property entitlement. A move towards nuclear families has provided an opportunity for many of these disgruntled nephews to work outside of the jointly held properties. These changes in the labour supply obviously have had implications on tank maintenance. In the case of some joint families, for example Anerimuttil (JF-1), the individual ownership rights of nephews and sons-in-law who jointly work in the lands are protected legally by contractually setting up a trust land. They are thus motivated to work along with other members, having traditional entitlements to the jointly held property, and are found to invest their labour in modifying the tank system. The tank of JF-1, once totally dependent on the natural flow of water from the upland marshy land, is now sustained through reinforcement on three sides with the help of state funds and tapping water from the marshy land through the un-concreted side. Thus, this joint family illustrates a case of combining the strengths of traditional system and the avenues opened up under state's development initiatives. Besides cultivating cash crops on trust land, this joint family explores new livelihood options, such as aquaculture in the tank, using state funds.

Another case of relatively well-maintained tanks is that of Kappumkolli (JF-9), which is de facto partitioned. One of the family members is working in a capacity that requires close interaction with the panchayat and is in a position to avail information about the development schemes and access them at the right time. In this case, the panchayat is undertaking desilting of the tank, employing its development funds and supplying the labour under MGNREGA. Therefore, even without joint family labour, the tank continues to be relatively well maintained.

In the third case, the de facto partitioned joint family, Neerchaal (JF-12), allowed a naturally recharging tank located in an ideal marshy land to be defunct. The tank was destroyed due to the construction of a new road in the area. The water from the marshy land was then diverted to a new storage tank built by the state. It was very obvious that the tank was sustained not because of the effort, labour or resources of the joint family but because of state support. The current tank is far inferior when compared with the previously naturally recharging tank, because of its dependence on the undependable rain water.

Of the three cases discussed here, two (JF-9 and JF-12) are sustained due to external factors and the third one (JF-1) due to a combination of internal and external factors. Analyzing the

involvement of both partitioned (including de facto partitioned) and un-partitioned joint families in tank sustenance, we do not find any community self-reliance but a great reliance on the state to take over the responsibility of water supply.

Only five unmaintained tanks (JF-7, JF-8, JF-10, JF-14 and JF-15) of the partitioned, including de facto partitioned, joint families are found to be tapping water from marshy lands following traditional ecological wisdom, while the rest have been converted to water storage tanks. To a large extent, the Kurichiyans themselves are responsible for this state of affairs as they are increasingly becoming dependent on state funds for reinforcement and maintenance of the tanks. It signifies both the eroding community norms in the joint families and the lack of involvement and initiative of the members. As in the case of JF-10, the state had put in funds to reinforce the tank boundaries and remove the silt but the tank had reverted to a state of neglect with the concrete reinforcements dilapidating and silt getting re-deposited. The members of the family did not take any initiatives to either use their own labour or resources or approach the panchayat to renovate the tank. In fact, none of the joint families have been using their common trust resources towards maintenance of tanks or showing vigilance in protecting the marshy lands, keeping in mind the traditional understandings of water recharge.

Siltation of tanks is a problem that leads to the discard of tanks except when state support could be effectively used. We observed that there has been no effort by the joint families to desilt the tanks, for instance by JF-4, JF-5, JF-6 and JF-12, and make them functional even when there is good water source (marshy land) to sustain them. With changes in the vegetation on the uplands, soil erosion is the major fear preventing joint families from considering desilting to be their own responsibility. Moreover, the prohibiting cost of desilting also creates a major hurdle and the joint families now consider this task to be entirely a state responsibility. In JF-6, one of the tanks located amidst paddy fields is now unusable, filled with silt, and the reinforcing walls have dilapidated. Another tank constructed as state development intervention was in a low-lying area and its faulty design and wrong site selection and the problem of water leakage have made it dysfunctional. As the site had not been selected on the basis of any consideration on the water source, no amount of repair work would make it functional. Since the beginning of our field work, this joint family, de facto partitioned, has constructed two more tanks with state support. Only one of these is functional whereas the other does not have water, a situation which the family understands as being caused due to changes in the cropping pattern in the region, as discussed in the cases of JF-14 and JF-15.

It is significant to note that with changes in vegetation due to large-scale destruction of screw pine (*kaitha*), bamboo and reed, usually planted alongside the field and tank boundaries to prevent soil erosion, and new constructions in the region, Kurichiyans' understanding of marshy lands and tanks has changed. Now they consider it essential to have reinforcements on all the four sides of a

tank to prevent the upland eroding soil from falling into a tank rather than leaving the marshy side of a tank open to tap water.

In two of the five joint families (JF-7, JF-8, JF-10, JF-14 and JF-15), which are still tapping water from marshy land, the tanks have been destroyed as a result of state development initiatives; for instance, due to the laying of a new road in the case of JF-8 and the construction of a new canal system in the case of JF-10. This has altered the marshy landscape and negatively affected water recharge in the area. In the case of JF-8, the construction of the road has deteriorated both quantity and quality of water. Members of this joint family also revealed to us that they have apprehensions in removing the silt from their tank as that may bring down more upland soil due to the present thin vegetation. In another case (JF-7), the tank construction begun by the state funding has been dragging on for more than two decades as the joint family could not effectively negotiate with the contractor with whom the repair work was entrusted. There was also an unfortunate situation in which a particular joint family member, a septuagenarian, in whose name the fund of INR 80,000 was sanctioned by the panchayat, had to face the allegation of swindling money. Such experiences with the use of state funds deter many people from accessing these funds for effecting tank repair work, although they are unanimous in their opinion that without state support, these tanks cannot be repaired. In the fourth case, displaying total disregard for traditional ecological wisdom of the Kurichiyans, the settler families use the surrounding the marshy land, the source of water for JF-14 as well as JF-15, as additional source of water to be used in their cultivation of water-intensive cash crops such as banana and ginger, detrimentally affecting the sustenance of this marshy land as a source of irrigation water for Kurichiyan tanks.

The Kurichiyans are beginning to find water-intensive cash crop cultivation more lucrative. Some family members, as in case of JF-15, prefer canal irrigation over renovating the tanks to suit the change in the cropping pattern. In fact, there is an increasing trend in the region towards conversion of low-lying paddy land into lucrative banana cultivation, which fetches five times more returns than paddy. On an average, the profits from banana cultivation is around INR 125,000 per ha compared to INR 20,000 per ha from paddy cultivation. We found that 17.16 ha of Kurichiyan paddy fields, that is, 10.8% of the total landholding (159.28 ha) of all the 15 joint families, were being used for banana cultivation.

The Kurichiyan joint families have increasingly become aware of the state's local development funds and programmes and are careful not to miss out on any opportunities of funding. At times, it is even at the disregard of their traditional ecological wisdom of marshy land, as can be seen in the case of JF-11. This joint family availed state development funds to construct a tank, not because the land was considered ecologically suitable but because of the belief that state funds for tank building would otherwise lapse.

The same mistaken logic is also expressed in the community preferring to use state funds to construct new and modernized water storage tanks even in ecologically uncongenial low-lying areas amidst paddy fields and discarding the ecologically congenial tanks in the upland region, which could otherwise be made functional with desilting or removal of the water weeds. Using the state-sponsored Brahmagiri Watershed Development Scheme, JF-3 has done exactly this. Instead of making their traditional tank functional, they discarded it due to heavy siltation. Moreover, they did not wish to undertake the labour-intensive job of desilting. Instead, they preferred to construct a blocking wall across the discarded tank in the marshy land to stop further siltation, while reinforcing the new tank with concrete walls all around to act as a mere water storage tank.

In the case of JF-15, a tank reconstructed with funds from the state irrigation department was desilted using MGNREGA resources and all the four sides of the tank were reinforced. A canal system was also put in place with funds from Brahmagiri Watershed Development Scheme. As a result, this tank lost its natural water recharging capacity and has now become merely a rainwater storage tank. This fascination for modernized structures at the expense of traditional ecological wisdom can be seen also in the case of JF-2. This joint family disregarded the old system of watershed management and converted the naturally recharging and filtering water holes (*keni*)—the presence of which helped water seepage in tanks—into cemented wells. The major state-run irrigation project with a canal going through the area has further demotivated this joint family (JF2) from maintaining their tank.

## 5. DISCUSSION

A detailed case study of tanks of the Kurichiyan joint families shows that social transformations and external factors have taken the Kurichiyans away from their community norms, which upheld collective responsibility for an ecologically sustainable livelihood system with the tanks occupying the pivotal role, to a more nucleated, economically rational and state-dependent notion of development where ecological wisdom and sustainability take the back seat. Diminishing community norms along with a growing dependence on mainstream development initiatives have made the Kurichiyans demand more and more state interventions as they wish not to be left out of the mainstream aspirations. The traditional cultural norms of matrilineal inheritance, which were promoted through the institution of *kumjukutty swathu*—meant for the upkeep and security of its vulnerable members—have waned with the state outlawing this system and also because of the consequent rise of the individual members' desire to receive benefits from social security and development provisions of the state. Thus, this process of declining community norms and increasing dependence on state is accentuated by individual valuations of the citizenship

entitlements enshrined in state development policies and programmes. The availing of state housing schemes, which gives funds to individual beneficiaries for construction of houses if they have property in their name, has been a strong incentive to break away from joint family living (Menon 2012). In fact, by the time this study was undertaken, only four joint families remained and the rest had become de facto or de jure partitioned.

This changing trend in the community norms has created individual aspirations, particularly of the younger generation, with potential to access state machinery, in two major ways. On one hand, some created new trust lands through legal contractual arrangements to protect individual land ownership entitlements based on which new development funds could be accessed for livelihood or infrastructure development, as in the case of construction of new reinforced and modernized tanks in which aquaculture and other new livelihood options could be experimented with. On the other hand, diversification of livelihood options, in which voluntary labour had to be supplied, allowed some to take up occupations other than agriculture, including that through the country-wide popular MGNREGA scheme. Both these trends have led to shortage of voluntary joint family labour to help in the upkeep of tanks.

The new economic rationality in favour of water-intensive cash crops have led to more land being brought under cash crops and greater conversion of low-lying wet paddy land. More importantly, there is a great reluctance to let go any development funds even if at a great ecological cost, as in the case of preference to reinforced water storage tanks over naturally rechargeable traditional tanks. The Kerala Conservation of Paddy Land and Wetland Act, 2008 (Government of Kerala, 2008), on one hand, and Kerala State Government's "EMS Housing Scheme"[2] and Government of India's "Housing for All" scheme,[3] on the other hand, are conflicting in their consequences. The 2008 Act prohibits any conversion or reclamation of paddy fields and neglect

[2] Kerala State Government's "EMS Housing Scheme" aims at completely remedying the housing problems of the poor in the state by providing land for all landless households below the poverty line and providing housing for all housing units below poverty line. This information was retrieved from http://lsg.kerala.gov.in/en/schemes/ems-housing%20scheme, accessed on 5 December 2018.

[3] Indian government's "Housing for All Scheme" (Pradhan Mantri Awas Yojan-Gramin, earlier called Indira Awaas Yojana) aims at providing a *pucca* (permanent) house, with basic amenities, to all houseless householder and those households living in *kutcha* (temporary) and dilapidated house by 2022. The government provides per-unit assistance of INR 120,000 to INR 130,000 depending on geographical location. The beneficiary is also entitled to INR 90.95 person day of unskilled labour from MGNREGA. This information was retrieved from https://reporting.nic.in/netiay/newreport.aspx, accessed on December 20, 2018.

of wet lands and is aimed at water security. Kerala Government, however, has amended this Act to allow small landholders to build houses or shops on 5–10 cents (one cent = 0.004 ha) of unnotified land and enable easier land acquisition for government projects (*Indian Express*, 2018). It also justifies the reclamation of paddy fields and wetlands in the state before the formulation of 2008 Act (Chitra, 2016). This amendment would obviously lead to the expansion of housing schemes, which are based on nuclear family (individual) entitlements, and thereby to proliferation of house construction in the wetlands across Kerala, including Wayanad District, and to obvious destruction of marshy land vegetation.

Despite state promotion of watershed-based development programmes, [4] the naturally recharging tanks are neglected as a result of people's preference to water harvesting policies that lead to the creation of reinforced storage tanks in a region, where erratic and deficit rainfall over the years has been causing great concern and has attributed to climate change (Nandakumar, 2017; Radhakrishnan & Gupta, 2017). Such state intervention in improving water control is "a hand off approach to programmes" when "a hands-on approach and a fluid choice of techniques contingent upon the unique constellation of resource and social features of a tribal locale" is required in such situations (Phansalakar & Verma, 2004, p. 3475).

A related issue is that the mushrooming of houses in the marshy lands has led to accentuated siltation of tanks through destruction of the water-friendly natural vegetation, which controls soil erosion, and the expense of desiltation is furthering the state dependence of a once self-reliant community.

Inhabiting in the Wayanad region of Kerala, which was known to be rich in natural resources, with strong cultural norms, the Kurichiyans were insulated as a closed community and were also protected from the large-scale land alienation that other tribal communities in Kerala experienced in the post-independence era. Incorporation into the mainstream development regime of the state and its jurisprudence, our study reveals, has had unintended repercussions on the community, its values and self-reliance. Literature on tribal communities in the decentralized development context in Kerala also suggests that state programmes intended exclusively for their benefit further marginalize and deprive the tribal communities (Sreekumar & Parayi, 2006) and fail to give them the chance to define their own development priorities (Kjosavik & Shanmugaratnam, 2006), and

[4] Kerala State Government's decentralization development strategy encourages integrated and coordinated efforts for watershed development wherein state, local self-government and communities have to contribute to develop a watershed.

also threatens their traditional institutions such as agrobiodiversity management (Padmanabhan, 2008, a study in the Kurichiyan context).

## 6. CONCLUSIONS

This study shows that state entitlements channelled through decentralized and participatory development initiatives promote individual citizen's entitlements, which erode community norms and conflict with its own policy of strengthening community participation in tank irrigation to ensure water sustainability. This is exemplified in our study of the specific community and ecological context of an indigenous agrarian community which, in many unintended ways, is witnessing a systematic disintegration of their community norms and resource endowments. The state programmes of water conservation and irrigation, housing and building of public infrastructure, when applied to indigenous people's habitat, could be intrinsically conflicting in their outcomes despite being well-intentioned. These development initiatives tend to neglect indigenous people's sound traditional ecological wisdom of water conservation befitting the natural landscape, thereby leading a previously self-sustained community to be dependent on the state and resorting to individual citizen's entitlements upheld by the state's development initiatives. To sum up, this study presents an appreciation of the regional advantages of the landscape-linked ecological wisdom of water conservation held by the indigenous communities and redefines the notion of development in line with them to achieve ecological sustainability. The unprecedented Kerala floods of 2018 is warning enough that a wilful neglect of ecological wisdom will seriously set back development efforts and achievements.

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