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THEMATIC ESSAY

Inclusive Management of Our Water Commons

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Abstract: In the past 75 years, since Independence, the central and state governments in India have implemented various measures for water management, which include initiatives to construct and revive small water bodies and wetlands. Schemes such as Amrit Sarovar, Amrit Dharohar, Jalyukta Shivar, and Galmukta Dharan-Galyukt Shivar are being implemented to revive small water bodies. However, these schemes have been criticised for their unsystematic planning and implementation and for benefiting an elite section of society while excluding people experiencing poverty. India is known for its traditional water harvesting systems and community-based management of water commons. Through a case study of grassroots-level management of small-scale waterbodies in eastern Maharashtra, this paper demonstrates the need to understand local dynamics and ground realities for inclusive and efficient water management.

Keywords: Water management; Commons; Tanks; Irrigation; Fisheries; Conflict

1. INTRODUCTION

As we cross the 75th anniversary of India's Independence, the central government has launched various events and schemes to celebrate *Azadi ka Amrit Mahotsav* (75th Independence Day celebration). The schemes focusing on waterbodies and wetlands in India include Mission Amrit Sarovar and Mission Amrit Dharohar. Mission Amrit Sarovar aims to construct or develop at least 75 ponds in every Indian district and help fight the acute water crisis in India (Mission Amrit Sarovar 2023). Mission Amrit Dharohar is part of the "Green Growth" priority, one of the seven priorities of the Indian Budget 2023–24. The scheme promotes the optimal use of wetlands

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to enhance biodiversity, carbon stocks, eco-tourism opportunities, and income generation for local communities (Jha 2023).

As India is rich in wetland ecosystems, the Indian government's focus on and investment in reviving waterbodies and wetlands is a step in the right direction. According to the Ramsar Convention, most natural and artificial waterbodies and wetlands in India form wetland ecosystems, but only 75 wetlands are listed as Ramsar sites (Banerjee *et al.* 2023; Ramsar 2023). For centuries, small waterbodies have formed the centre of the country's traditional water-harvesting systems (Agarwal and Narain 1997; Mishra 1993; Reddy 1990). Traditional water-harvesting systems have provided numerous services, including meeting the domestic and livelihood needs of the rural population. But their importance has declined following Independence and they have fallen into disrepair (Reddy *et al.* 2018). Consequently, considering their importance and status, government schemes focusing on waterbodies and wetlands must draw learnings from current grassroots and community-led initiatives targeting small waterbodies. They must focus not only on the success of community initiatives but also on the challenges communities face in the implementation process.

In the last 75 years, various government initiatives and strategies for water management have been introduced. After Independence, the Indian government applied a top–down approach and built dams and canals to increase agricultural productivity in the developing nation (Iyer 2003; Palanisami and Meinzen-Dick 2001; Pradhan and Srinivasan 2022). Interlinking rivers in India to transfer water from surplus to deficit river basins is one of the proposed ideas under the top–down approach. However, researchers have criticized this approach because of its potential environmental and social impacts. Interlinking of rivers would not only disrupt river ecosystems but also displace people from their land and homes (Iyer 2014; Bandyopadhyay and Perveen 2004).

The 1980s–90s saw the beginning of considerable opposition from civil society to the top–down, supply-oriented approach because of the social and environmental impacts of dams as well as the resistance from movements opposing corporate exploitation of water resources (Shah 2003; Raman 2005; Mehta 2010). Thus, the World Commission on Dams (WCD)—established in 1998—reviewed the effectiveness of dams. The main findings of the WCD assert that dams have failed in achieving their targets in terms of electricity production, ensuring water availability, and flood control. The report also highlights the social and environmental impacts of dams and recommends maximizing the efficiency of existing water systems (WCD 2000). The same period saw increasing demands for the devolution of water management to communities and the revival of small-scale, sustainable water management

systems (Iyer 2008). The Indian government also adopted bottom-up initiatives, such as participatory watershed management, irrigation management transfer (IMT), and participatory irrigation management (PIM) (Menon *et al.* 2007).

However, despite all these water management efforts in India, we are still learning to deal with challenges such as droughts, floods, and disputes over the sharing of water for drinking, irrigation, and other purposes. These challenges have persisted with time, indicating the need for a change in our approach to water management. Addressing water management challenges requires macro- and micro-level reforms (Thakkar and Harsha 2019).

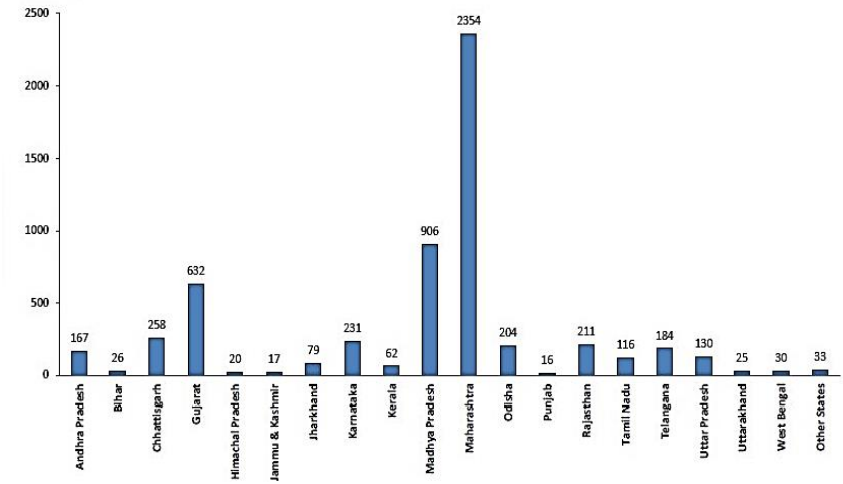
In this essay, we focus on one of the micro-scale water management systems, i.e., *maji-malguzari* (MM) tanks, which are a form of water commons in the eastern Vidarbha region of Maharashtra. Using the example of MM tanks, we highlight various issues in current management approaches and argue that water management approaches must be more inclusive in addressing water management challenges. To make this argument, we draw insights from two separate field studies conducted by the authors in the Bhandara and Gondia districts between 2014 and 2021. The field studies include the first author's PhD research on community-based water management of MM tanks and the second author's research on freshwater biodiversity conservation with fishing communities. The case study presented in Section 2.6 is derived from the second author's research as a part of the Maharashtra Genebank Programme (MGP) (ISSER 2020).

2. WATER MANAGEMENT IN MAHARASHTRA

The Indian state of Maharashtra is renowned for its various water management initiatives. It is well known for its traditional community-managed systems such as the *phad* system in north-western Maharashtra and the MM tank system in the eastern Vidarbha region (Agarwal and Narain 1997; Menon *et al.* 2007). The phad system is a 300-400-year-old community-managed irrigation system in which a series of *bandharas* (diversion weirs) were built on rivers in the Tapi river basin to divert water for irrigation (Agarwal and Narain 1997). The MM tank system derives its name from the land tenure system prevalent during British rule in the central provinces. This community-based irrigation system was developed in central India during the pre-colonial period and continued during the colonial period (Mahajan *et al.* 2021). Maharashtra has the highest number of large dams in India (2,354), constituting 41.29% of the large dams in the country (GoI 2018). It is a pioneering Indian state, having initiated the water-sector reform process through the Maharashtra State Water Policy, 2003; Maharashtra Management

of Irrigation Systems by Farmers (MMISF) Act, 2005; and the Maharashtra Water Resources Regulatory Authority Act (MWRRA), 2005 (SOPPECOM 2012). These reforms highlight the need for water users to participate in water management and the need to ensure legislative support for participants. The state boasts success stories such as the initiatives implemented in Hivre-Bazar and Ralegan-Siddhi villages, renowned for their participatory watershed management and the Ozar water user associations (WUAs) movement (Paranjape *et al.* 2003). Though studies have highlighted equity- and participation-related issues, these ventures have improved water availability in a conventional sense by improving the overall efficiency of irrigation management of water structures and maintenance of WUA records (Sangameswaran 2008; Paranjape *et al.* 2003).

Figure 1: State-wise Distribution of Large Dams (Completed and Under Construction) in India



Source: National Register of Large Dams, Government of India (2018)

Similarly, in its commitment to the Sustainable Development Goals (SDGs) 2015, the Maharashtra State Water Policy, 2019, acknowledges the need to manage water resources sustainably and equitably. The policy dictates that the state is responsible for the effective development and management of water resources to achieve SDG-6 (ensuring clean water and sanitation for all), SDG-12 (ensuring sustainable consumption and production patterns), and SDG-15 (protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification, and halting degradation and biodiversity loss) (GoM 2019).

However, the following example demonstrates that this acknowledgment of SDG goals does not translate to the implementation of legislations and schemes. In 2015 and 2017, the Maharashtra government promoted the flagship schemes, Jalyukta Shivar Abhiyan (JSA) (water-rich farmland scheme) and Galmukta Dharan-Galyukt Shivar (GDGS) (silt-free dam and silt-rich farms) for drought mitigation (Zade *et al.* 2020; Bhadbhade *et al.* 2019), respectively. The JSA, launched in 2015, aimed to make 25,000 villages in Maharashtra drought-free between 2015 and 2019. According to a Comptroller and Auditor General of India (CAG) report, the Maharashtra government spent ₹9,633.75 crore under the JSA on 6.41 lakh works during 2015–19 (CAG 2020). In 2019, there was a claim that the JSA[1] projects had helped improve the crop yield in villages where works had been completed by bringing more area under irrigation (Jitendra 2019). However, the CAG report implies faults in project planning, implementation, and evaluation, and several researchers have criticized the scheme (Tiwale 2020). The main failing is that despite the JSA being a programme for de-siltation, state agencies carried out de-silting activities in rivers and *nalas* (streams) solely to demonstrate water storage during the rainy season. This was, however, done without conducting an environmental assessment of river flows or a scientific assessment of the levels of silt in the riverbed. Bhadbhade *et al.* (2019) also highlight the poor participation of people due to a lack of awareness of the scheme and the construction of poor-quality physical structures under the JSA.

Thus, the state's focus appears to be limited to immediate outcomes and benefits instead of sustainable water management that considers ground realities. Especially in the case of small-scale water commons, which are also multiple-use commons, consumptive uses such as irrigation and revenue generation through fisheries are given priority over the role of the commons in supporting rural domestic activities, local biodiversity, and groundwater recharge needs (Meinzen-Dick and Bakker 1999). Moreover, different governing bodies focus on functions such as irrigation and fisheries, ignoring the interactions and conflicts between various uses (Rajankar 2011b). In such cases, legislations such as the MMISF and schemes such as JSA—which focus primarily on irrigation and increasing water storage—fall short. These legislations and schemes do not engage with the many functions associated

[1] The Maharashtra Remote Sensing Application Centre (MRSAC) has developed an application for the Water Conservation Department, Government of Maharashtra, where village-wise information can be gathered about the work completed as part of JSA by various government departments such as agriculture, irrigation, revenue, and forest.

with multiple-use commons and often focus on economic gain or short-term solutions to water-related issues (Bhadbhade *et al.* 2019).

2.1 Maji-Malguzari Tanks

The MM tanks in the eastern Vidarbha region of Maharashtra are artificial water reservoirs whose construction began during the pre-colonial period, dating back to the sixteenth and seventeenth centuries when the Gonds ruled in central India (Russell 1908). To increase revenue from agriculture, Gond kings invited communities to clear forests, built irrigation tanks, and promoted the cultivation of cash crops—such as paddy and sugarcane—in high-rainfall areas (Pallavi 2014). The story of the settlement of the Kohli community on a Gond king's invitation is well known in local areas; the Kohlis were known for their tank-building skills (Paranjpye 2004; Rajankar 2011a; Majmudar 2020). The Marathas, who ruled in central India after the Gonds, further encouraged tank building by renewing the leases of *patels*, who made improvements to their villages by investing in tank construction and agriculture (Russell 1908). During the Gond and Maratha periods, the king appointed the patel, who bore the responsibility for revenue collection and administration in the designated area (Rajankar and Dolke 2001).

The spread of tanks in eastern Vidarbha districts is such that every village has one or more tanks of varying sizes. According to a 2012 report, there are 6,828 MM tanks in the eastern Vidarbha region, and their irrigation potential is 147,903 ha (Kimmatkar 2012). Residents of some villages have even built an irrigation system with a network of interconnected tanks to collect as much rainfall as possible (Paranjpye 2004). At present, MM tanks are an essential part of paddy irrigation, the staple crop in this region. Initially, tanks were mainly constructed for irrigation, but they gradually became an essential part of other livelihood-supporting activities such as fishing and the extraction and sale of vetiver grass, lotus flowers and stems, and water chestnuts (*Trapa natans*; variety: *Bispinosa*). In addition, tanks are habitats for various aquatic flora and fauna, serve as sources for groundwater recharge, and support several domestic and cultural activities (Rajankar 2011a; IISER 2020).

Under British rule, in the 1860s, the alternative term, *malguzar,* was coined for patel, when the malguzari class was established as part of a land-settlement strategy. The malguzar was in charge of revenue collection and administration (Velankar 2011; Harnetty 1987). Malguzars benefited from the surplus revenue generation and invested their efforts in tank-building and maintenance activities (Rajankar and Dolke 2001).

The management and use of MM tanks evolved slowly. During the pre-colonial and colonial periods, the responsibility for MM tank management,

repair, and water distribution rested with the villagers and was overseen by the patel/malguzar. A committee of farmers was established to address water distribution and conflict resolution. The committee appointed a *pankar* (water distributor) to release water according to the decided distribution schedule and ensure no farmer broke the committee rules. Farmers paid the pankar in cash or kind. When farmers broke irrigation canals adjoining their farms to take irrigation water out of turn, consequently affecting water distribution and committee regulations, the committee suspended access to water for the farmers until the following year or till the dues were paid (Paranjpye 2004).

After Independence, the Indian government abolished the malguzari system in 1950 by enacting the Madhya Pradesh Abolition of Proprietary Rights (Estates, Mahals, Alienated Lands) Act, 1950. After this abolition and following the formation of Maharashtra state in 1960, tank management became the state's responsibility. The government renamed tanks "maji-malguzari" (ex-malguzari) (Mahajan *et al.* 2021). Tank-management duties were divided among various state-governed irrigation bodies based on the irrigation capabilities of the tanks. Smaller tanks with an irrigation potential <100 ha were transferred to the *zilla parishad's* (district council) minor irrigation department, and larger tanks with an irrigation potential >100 ha were transferred to the Maharashtra State Irrigation Department (Kimmatkar 2012). These governing bodies became responsible for developing the tanks' irrigation potential and overseeing the water distribution process.

The irrigation department took over tank-management responsibilities and implemented changes in tank structures—including modifying old tank structures such as tank irrigation gates, embankments, overflow structures, and irrigation canals—to improve the water storage and command area. While these changes helped make tank structures more enduring, they increased villagers' dependence on the irrigation department. Moreover, the irrigation department applied modern engineering techniques without consulting tank users. The villagers thus slowly became dependent on the irrigation department if tank structures needed significant repair.

In addition to irrigation-related changes, the Maharashtra government promoted the formation of fishery cooperative societies in the 1970s to increase the economic benefits from fishing. The Maharashtra Fisheries Department and *panchayat samiti*[2] leased tanks to fishing communities in the region. The fisheries department introduced Indian major carps (IMCs) such as Catla (*Catla catla*), Rohu (*Labeo rohita*), and Mrigal (*Cirrhinus mrigala*).

[2] A taluka or a subdivision of a district-level governing body in a three-tier *Panchayati Raj* system.

Production and profits for fishers were large in the beginning. However, IMC species slowly replaced indigenous fish species because of compatibility issues (Rajankar 2011b). Introducing IMCs and fishing techniques involving drag nets negatively affected the aquatic biodiversity and habitat, consequently negatively impacting IMC yields (Khandekar 2020). Thus, such interventions without a proper understanding of local management practices, ecology, and livelihoods gave rise to various management challenges and conflicts.

2.2 Management Challenges

Considering the expanse of tanks, routine tank management became a considerable challenge for the government. The first irrigation commission recommended collecting fees for using irrigation water from MM tanks. However, descendants of malguzars filed and won a Supreme Court case against this decision (Majmudar 2020). Farmers with free irrigation rights called *nistar* rights—documented in the *Nistar-Patrak*—get free water for Kharif crop irrigation (Velankar 2011). Most farmers with nistar rights belong to the dominant castes[3] in the region and have strong political networks. Fishers[4] belonging to the Nomadic Tribes (NT) category and small farmers belonging to the Scheduled Caste (SC) or Scheduled Tribe (ST) categories with nistar rights are rare and have received those rights through land purchase. Enforcement of free irrigation rights for the primary crop cultivation season has led to less revenue generation from the tanks and, subsequently, loss of interest on the irrigation department's part in their management (Majmudar 2020).

The state irrigation department also formed WUAs to manage MM tanks, but several remain only on paper. Moreover, there is reluctance on the part of farmers and the government to maintain formally registered WUAs. Farmers believe that formalization is a burden, as it demands extensive record-keeping and legal obligations to follow complicated rules. In the government's case, this entails a monetary and resource burden to monitor something that offers little revenue. In turn, villagers needing water for their crops have formed informal water management committees (WMC) in their villages. They took over the water distribution and basic maintenance of tanks and canals when they realized that depending on the government would not ensure water for irrigation. Thus, villagers adopted the same water distribution and management techniques followed during the malguzari

[3] Dominant castes in this area include Kohli, Kunbi, and Teli, which belong to the Other Backward Castes (OBC) category.

[4] Fishers belong to the Dhiwar/Dhinwar Caste, which is categorized as a Nomadic Tribe (B).

period. With no support, recognition, or formal mechanisms to induce equitable participation, informal systems work with varying levels of efficiency in each village. For example, in Bolde village, where the WMC head is actively encouraging tank water management, irrigation, and water distribution, WMC record-keeping is up to date. In contrast, in Bampewada village, there are multiple conflicts over water distribution and tank encroachment. In villages where WMCs are actively managing tank water, large farmers' interests take precedence over the concerns of farmers without nistar rights and fishers. As a result, poor farmers and fishers are at the mercy of large farmers for water access.

2.3 Conflicts over Multiple Water Uses

Dropping tank water levels in summers lead to conflicts among farmers, fishers, and livestock owners. Considering this, a Maharashtra government resolution (GR)[5] from 1990 directed the halting of irrigation using tank water once the water levels reached dead storage levels. This directive intended to maintain water levels for fisheries and livestock. However, farmers do not follow these provisions in practice. The low-water-level period coincides with summer paddy crop cultivation. When farmers' private irrigation sources are inadequate, they use diesel pumps to access tank water. The use of these pumps becomes a source of conflict, causing tensions between farmers and fishers. Simultaneously, fishers are held responsible for unsettling water through fishing activities, thus rendering it undrinkable for livestock.

There are conflicts not only between farmers and fishers but also among farmers themselves. Farmers who do not have nistar rights constantly struggle and negotiate with other farmers to get tank water, even if they have a permit from the irrigation department to access tank water for irrigation. Large farmers from dominant castes possess land in areas that are reachable by irrigation; they have also dug borewells on their farms. The increasing construction of borewells within the catchment and command areas of tanks has begun to affect the water storage in MM tanks. Moreover, large farmers are utilizing the communal water source for personal benefit. Thus, there is a strong need for an effective mechanism to address these issues.

2.4 Budgetary Allocations

Though the Dandekar Committee Report (1984) on the regional imbalance in Maharashtra highlights Vidarbha as a mainly underdeveloped region in Maharashtra, it notes that irrigation development in Bhandara, Chandrapur,

[5] Government resolution on maintaining water levels in a tank: GR No.PTN1089/14376/35 (dated July 9, 1990).

and Nagpur districts was good.[6] While malguzari tanks were deteriorating, funds were not allocated for their development. However, later reports on MM tanks (Kimmatkar 2008, 2012) and the Kelkar Committee Report (2013) highlight the importance of MM tanks for irrigation and fisheries. The Kelkar Committee recommended a ₹2,520 crore budget for MM tanks, which was 38.2% of the water-sector allocation. Based on this recommendation, the Government of Maharashtra allocated revenue for MM tanks under the JSA, GDGS, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), and MM tank restoration schemes. Works undertaken through these schemes mainly involved the de-siltation of MM tanks and the repair of canal structures. In the case of fisheries, the state fisheries department only allocates 3% of its overall budget to freshwater fisheries, but the allocated budget is focused on the aquaculture of commercial fish species and not indigenous fish species.

2.5 The Negative Impact of Government Interventions

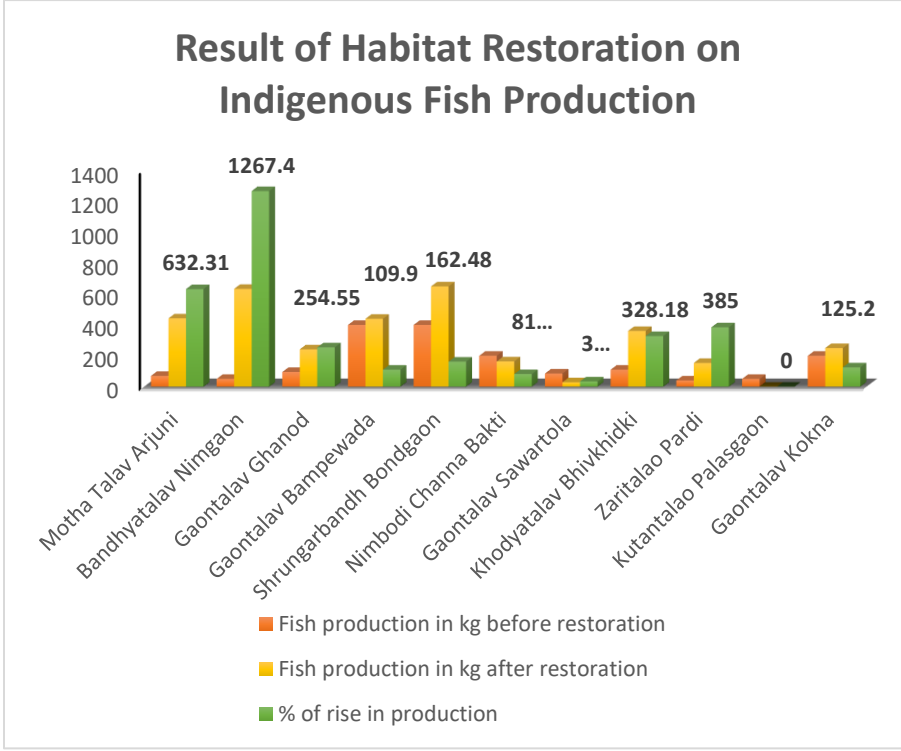
During our field interactions, farmers contended that paddy irrigation should take precedence over fishing as the main use for tank water. Simultaneously, aquatic biodiversity receives no consideration from the government. In the case of MM tanks, we also observed this attitude during JSA and GDGS implementation. Tank de-siltation is essential as it increases the tank's capacity to store water and provides nutrient-rich silt to farms. However, in many waterbodies where tank de-siltation works were conducted, favoured machinery included mechanical excavators, which unevenly dug tank beds and affected the aquatic flora and fauna. Destruction of aquatic flora and fauna negatively impacts native and introduced fish species as it alters the habitat of the native species and the food sources of the introduced species (Majmudar 2020). Additionally, fishers complained of uneven tank beds affecting their fishing activity. According to them, the best way to de-silt tanks is manual excavation, wherein silt can be removed without damaging the plants and soil underneath.[7]

In the following section, we present a case study from the eastern Vidarbha region to showcase how an inclusive approach can be used to efficiently manage MM tanks and dependent livelihoods.

[6] In 1984, the Gondia district was part of the Bhandara district, and the Gadchiroli district was part of the Chandrapur district.

[7] This has been successfully implemented in some tanks by an NGO in the region with the help of local fishers, and positive results achieved (Rajankar 2023).

Figure 2: Indigenous Fish Production Before and After Habitat Restoration



Source: BNVSAM and MGP Database (IISER 2020)

2.6 Inclusive Approach

A non-profit organization (NGO) called Bhandara Nisarga Va Sanskruti Abhyas Mandal (BNVSAM) started working with fisherfolk in 2009, with the aim of reviving freshwater biodiversity in the MM tanks of Bhandara and Gondia districts. Between 2014 and 2021, they worked with 11 fishery cooperative societies to revive freshwater diversity in the tanks leased by fishery cooperatives. As part of the initiative, they made a wetland management plan with the fishers and conducted various works such as aquatic habitat development and the removal of the invasive species, *Ipomoea fistulosa*. For aquatic habitat development, they planted local aquatic plant species—submerged plants such as Hydrilla (*Hydrilla verticilata*), Coontail (*Ceratophyllum demersum*), and Tape Grass (*Vallisneria spiralis*); floating plants such as Water Snowflake (*Nymphoides indicum*) and Crested Floatingheart (*Nymphoides hydrophylla*); and partly submerged plants like Water Chestnut (*Eleocharis dulcis*) (Rajankar 2019). Following habitat restoration, the NGO

workers and fisherfolk observed positive results in eight tanks as the yield of indigenous fish species increased, ranging from 125% and 1,200% (IISER 2020).

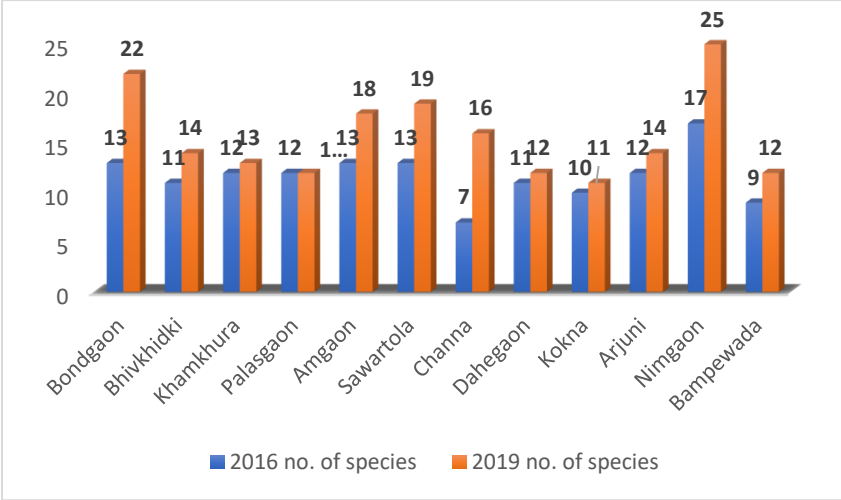
During their work with the fishers, primarily women and elderly fishers from fishing households, the NGO staff also discovered another overlooked issue, i.e., the role of fisheries in local food security. Indigenous fish species are known for their nutritional and medicinal value. Some indigenous fish species, such as Dadak (*Channa striatus*), Maral (*Channa marulius*), and Wagur (*Clarius magur*), are in high demand in local markets as they are known for their rich taste and nutritional value. These fish species also fetch more money compared to IMCs. The BNVSAM members took several steps to increase awareness of the importance of indigenous fish species and their availability. They encouraged fishery societies to ban the fishing of native species during their breeding period[8] (IISER 2020; Majmudar 2020). Fishers also understood the importance of indigenous fish species during the COVID-19 pandemic. When commercial fisheries were affected by the lockdowns, local fish species came to the rescue of many rural households, fulfilling their monetary and nutritional requirements. No government policies currently promote the production of indigenous fish species. However, if fishery cooperative societies are given the resources to support indigenous fish species, they can help improve food and economic security.

Before habitat development, many fishers complained about the reduced numbers and species of birds, which negatively affected the aquatic fauna. Habitat development of tanks also appears to increase the number and species of birds (see Figures 3 and 4).

In addition to their work on freshwater biodiversity, the NGO staff encouraged women from fishing households to form self-help groups (SHGs). These women SHGs are now participating in their villages' *mahila gram sabha* (women assembly) and raising questions about the poor water governance of MM tanks. During the gram sabha, women demanded the inclusion of works such as *Ipomoea* extraction and tank de-siltation under the MGNREGA. Approval of tank de-siltation work through the MGNREGA has benefited tank biodiversity and provided employment opportunities to around 5,000 families (IISER 2020). A total of 15,967 people worked on 37 jobs under the MGNREGA between 2019 and 2021 in 11 villages. Work under the MGNREGA included tank de-siltation and provided work for an average of 56 days to villagers.

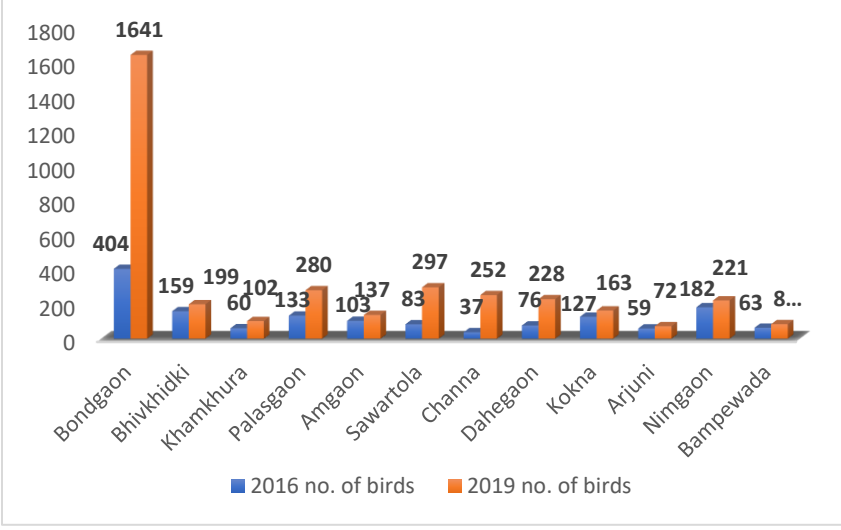
[8] Fish travel upstream during the monsoons in search of suitable breeding habitats. This process is called reverse migration.

Figure 3: Number of Bird Species Before and After Habitat Development Activity



Source: BNVSAM and MGP Database (IISER 2020)

Figure 4: Number of Birds Before and After Habitat Development Activity



Source: BNVSAM and MGP Database (IISER 2020)

This case study illustrates how an inclusive approach at the grassroots level can lead to benefits at various levels.

3. CONCLUSION

In this article, we highlight that water is not just a commodity to support occupations such as farming and fishing but also a system supporting biodiversity, groundwater, local livestock, and other domestic needs. However, this complexity does not manifest in the government's current management approach. The state-governed bodies concerned with MM tanks operate individually, and interventions are often fragmented. Similarly, there are separate committees at the village level to manage irrigation and fisheries connected to MM tanks. This is necessary as these aspects require various kinds of expertise. However, there is also a need for a body that channels government support but provides autonomy and space to tank dependents to discuss their concerns on a single platform. It is essential to consider the maintenance of the tank catchment, water-spread area, and various structures, including canals. All tank-dependent farmers and fishers need to discuss how different activities are helping or hindering their livelihoods and their source of livelihoods, the MM tanks. Finding a balance between the needs of farmers, fishers, and other villagers is essential for sustainable long-term solutions.

The intentions of schemes such as Amrit Sarovar, JSA, and GDGS are appreciated. However, such schemes are often forgotten after their initial success, until the next water issue or conflict occurs, and they are often criticized for not being grounded in the local context. We need long-term and sustainable solutions that involve community participation in finding, planning, and implementing these solutions (Bhadbhade *et al.* 2019). It has been proven time and time again that water management and governance issues cannot be solved by engineering solutions alone (Thakkar and Harsha 2019). There is a need to approach water issues using a transdisciplinary lens where, in addition to economy and ecology, we focus on social and institutional factors influencing water management and governance to make it more inclusive (Ghosh 2018; Shah 2018). There is currently a gap between research and policy. Research highlights the multiple uses of commons and the complexities of managing conflicting interests, taking ground realities into consideration. However, this is not reflected in the policies or implemented schemes. Future research on water commons needs to focus on how the gap between research and policy can be minimized to make water management more effective.

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Ethics Statement: I hereby confirm that this study complies with requirements of ethical approvals from the institutional ethics committee for the conduct of this research.

Data Availability statement: The data used to support this research cannot be shared openly to protect the privacy of study participants and is stated in the paper.

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