Revisiting participatory forest management in India

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Participatory forest management (PFM) in India was initiated mainly with the objective of restoring degraded forests and to support livelihood of forest-dependent communities. PFM can help achieve India's mitigation targets such as the Paris Agreement in the forest sector, and improve livelihood of forest-dependent communities and biodiversity. However, there are several limitations in the current PFM policies and programmes to achieve such outcomes. This article, based on a review of the literature and examining government reports, discusses the current challenges in PFM and possible ways to strengthen its policies and programmes to achieve better forest management outcomes.

Keywords. Biodiversity, mitigation targets, participatory forest management, stakeholders.

INDIA has about 70 m ha of land under forest cover, which is about 22% of the total geographical area and over 78% of this lies outside protected areas (PAs)[1]. Deforestation and degradation are high in forests, particularly outside PAs causing biodiversity loss[2]. India is also facing rapid land degradation and forest fragmentation. The National Wasteland Atlas of India has classified about 65 m ha as wasteland that is unproductive[3]. This includes more than 5 m ha of degraded forest and scrub land. Forests with canopy cover less than 10% are classified as degraded. Several biodiversity-rich landscapes in the country are facing severe forest fragmentation issues[4]. In India, collection of fuelwood, fodder and non-timber forest produce (NTFP) is the primary cause of forest degradation[5]. The 2011 census in India showed more than 85% of over 830 million rural population using firewood as the primary source of fuel for cooking[6], and the 2012 livestock census showed the combined population of the indigenous cattle, goat and sheep at over 350 million (ref. 7). These animals are generally not stall-fed, thus adding to grazing and fodder collection pressure in forests. The country under its Green India Mission, initiated in 2008, aims at afforestation in over 10 m ha. In the recently submitted Intended Nationally Determined Contribution (INDC) under the Paris Agreement, India has committed to creating an additional carbon sink of over 2–3 billion

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tonnes through additional forest development by 2030 (ref. 8). Aggressive plantations may not be the answer to the challenges on managing forest degradation and achieving carbon mitigation targets in India. Global experiences have shown that forest management with the objective of improving forest cover or carbon sequestration alone could have negative impacts on land use[9], forest governance[10], and affect biodiversity and ecosystem services[11]. In India, in the past, forestry projects taken up with the sole objective of increasing carbon sequestration initiated through Clean Development Mechanism have negative impacts on ecology and local communities, and proved to be unsustainable in the long term[12].

Participatory forest management (PFM) approaches, globally have helped improve forest health and benefit local communities, including poverty alleviation[13]. PFM can also be explored for improving carbon sequestration in forests along with biodiversity conservation and meeting local community needs[14]. This article discusses the current challenges in PFM in India from a review of the literature and Government reports. It further discusses possible forest management strategies and policy changes to achieve better PFM outcomes on improved biodiversity, ecosystem services, carbon sequestration targets and livelihood of local communities.

Current challenges in PFM

India's PFM can be traced back to 1930s when village forest councils were formed in a few places, particularly in Kumaon region of the present Uttarakhand[15]. However, the formal process of PFM started only from 1990. The National Forest Policy in 1988 made a notable shift in forest management objectives from timber to meet the judicial needs of the local community. The Policy specifically mentions, 'The holders of customary rights and concessions in forests area should be motivated to identify themselves with the protection and development of forests from which they derive benefits'. This Policy formed the basis for the joint forest management (JFM) in India. Post the National Forest Policy, the Ministry of Environment and Forests (now the Ministry of Environment, Forest and Climate Change), Government of India (GoI), issued guidelines in 1990 advising the states to initiate JFM activities by constituting committees at the

village level and focusing primarily on degraded areas. The revised guidelines issued by the Ministry in 2000 made notable improvements in the PFM process by providing for expansion of JFM beyond degraded forests to good forest areas; and provided guidelines for preparation of micro plan for both new work plan and existing JFM work plan areas. The guidelines did not restrict extending JFM activities under any category of forest land: protected, reserved and village forest as classified under the Indian Forest Act, 1927. In PAs, the JFM committees function as eco-development committees, where in addition to JFM activities, they aim at protecting wildlife and improving biodiversity. The legal provisions in India allow for JFM to be initiated in three different ways: through forest working plans and annual plans, through national and state schemes, and voluntarily by the village community.

In June 2000, the number of JFM committees in India was only 36,075, managing a forest area of about 10.4 m ha. By June 2011, the country had 118,213 JFM committees managing about 23 m ha of forest land involving about 14 million households; of this over 15 m ha is in the central Indian states from Maharashtra to Odisha[16]. Despite the doubling of JFM areas in the country post the 2001 period, the impact on forest cover in India has been minimal[17] and PFM results are a mix of successes and failures. In Bihar and Jharkhand, over 60% forest area was under JFM, while in Himachal Pradesh only 5% of forest area was under JFM in 2011. Himachal Pradesh reported a further decline in interest in JFM activities; the number of registered JFM committees was 1562 in 2014, while in 2018 only 963 committees were reportedly carrying out JFM activities[18]. A forest audit report for Maharashtra notes that despite spending several million rupees on plantation and forest management activities, there has been no increase in forest cover over the period from 2008 to 2015 with no significant PFM outcomes, raising questions on the effectiveness of PFM schemes[19]. The India eco-development project implemented with support from World Bank from 1996 onwards in few PAs had shown mixed results. While the project helped improve livelihood of local communities and generate positive interest for conservation in the Periyar Tiger Reserve[20], in the Kalakad–Mundanthurai Tiger Reserve, this was largely a failure as the project did not effectively address local concerns[21].

Successful outcome of JFM activities in India has largely been dependent on institutional mechanisms that encourage wider community participation, importantly of women, micro planning process, forest protection and management, sustainable harvest and marketing, and benefit sharing with local communities, in addition to providing usufruct rights to local communities for collection of fuelwood, fodder and grazing[22,23].

There are severe institutional gaps in the current implementation of JFM programmes. The National Afforestation Programme (NAP) initiated in 2002 and continued till date after merging with Green India Mission, is the largest grants-in-aid JFM activity in India. The revised NAP guidelines issued in 2009 make the Forest Development Agency (FDA), which is registered as a society with members from the Forest Department and Gram Sabha, and the JFM committees equal partners in managing the JFM activities. However, the lack of interest or ownership among both agencies, technical capacity gaps in preparing micro plans and managing JFM activities, and lack of strong monitoring and evaluation mechanisms have made this scheme ineffective in achieving the desired results[24,25]. The National Afforestation and Eco-development Board (NAEB) established in 1992, is mandated to perform the role of monitoring and evaluation at the national level of all afforestation programmes. The NAEB has been functioning mainly on recommending the release of funds under NAP scheme after assessing proposed afforestation plans submitted by state FDAs, and there is no report on consolidated monitoring and evaluation done for NAP over the years. The NAP guidelines revised in 2009 have framed no monitoring and evaluation framework or indicators to be used, and have only recommended that the state government develop its own framework. The NAEB developed a framework that considers indicators like the number of JFM committees working, households, activities undertaken against the target[26], but does not consider measuring biodiversity, NTFP production, revenue generation and benefit-sharing, which are essentially important for successful PFM. Other than the JFM committees and FDA, the state Forest Department and its institutions like Forest Development Corporations (FDCs) and Cooperative Federations are important to facilitate PFM. The National Commission on Agriculture in 1972 and the National Forest Policy 1988 recommended establishing FDCs and Cooperative Federations for sustainable harvest and marketing of timber and NTFP. Except Chhattisgarh and Madhya Pradesh, no state has established Cooperative Federations at district and state level for NTFP collection and marketing. The Federations in these two states directly engage with local communities in procuring NTFP at the minimum support price guaranteed by the state or Central Government; some of the NTFP are also certified[27]. In Himachal Pradesh, despite the State Forest Policy in 2006 recommending the setting up of such Federations, there is none at present. While 22 states in India started with FDCs from 1974, many of them are not working actively. The Rajasthan FDC was closed in 1985. The Himachal Pradesh FDC scaled down on its timber production activities post the ban on green felling in 1996, and currently only procures resin (from *Pinus roxburghii*) and salvage trees from forest land and timber from private land[28]. Very few FDCs have sustainable timber production certifications from international agencies like Forest Stewardship Council, and currently there is no national-level agency to certify timber or NTFP on sustainability.

The legal issues surrounding JFM implementation are still unclear in many states. This includes challenges like registration of JFM committees under Societies Act, complex role of Gram Sabha and JFMC committees, with same or different elected members, and legal classification of land like the village forest, which is simply absent in many states despite the Indian Forest Act, 1927 making provisions for them to demarcate such forests[29]. Despite JFM guidelines and rules empowering women and members of marginal communities to be part of PFM executive and general councils, in practice their participation is less. This has been a major challenge for forest officials in managing JFM activities[30]. The stakeholder engagement process between Forest Department staff and local community was not good in many cases, leading to poor JFM outcomes[31]. Odisha that had long traditions of community-based forest management showed decreased interest in PFM due to new policies and regulations post 2000, mainly due to shifted powers from local community to elected JFM bodies[32].

Benefit sharing has been one of the important factors for the success of JFM[33]. On benefit sharing, several of the JFM models are economically non-productive, and there is no revenue generated to be shared with local communities. In Himachal Pradesh, post the Supreme Court order banning green felling in 1996, except according to the working plan, and further extending complete ban on green felling in elevation above 1500 m, the option of timber harvest from JFM activities and sharing of revenue is completely unavailable. This has affected the interest of minor and major stakeholders alike. Lack of marketing mechanisms and value chain for NTFP, ban on timber felling, inflexible administrative and institutional procedures, have hampered forest-based livelihood and PFM activities in Himachal Pradesh[34]. Similarly many other states also face challenges on making PFM economically productive to provide economic incentives to local communities in return for their active participation in PFM. A complex feature of JFM is the stakeholders' right to NTFP. Several factors influence NTFP as an incentive for participation in JFM; nationalization of tendu (*Diaspyrous melonoxylon*) has had mixed results. In Gujarat, it has led to increased participation in JFM activity while in Madhya Pradesh it has led to decreased participation due to excessive state control of NTFP and delays in passing down the incentives[35].

With the NAP focusing largely on forest cover improvement, forest plantations are seen as the main JFM activity even though they may not be ecologically suitable for the region or preferred by local communities. Monoculture plantations, particularly in central India, of species like teak (*Tectona grandis*) that has higher survival rate and can show improved forest cover in a quick period, are affecting biodiversity of some of forest areas by suppressing regeneration of other native species[36]; this also affects NTFP and fodder availability for local community use.

The Green India Mission proposed a landscape approach to developing additional forests that could also provide other co-benefits. The Mission targets at improved ecosystem services, including biodiversity, hydrological services and carbon sequestration from 10 m ha of forest/non-forest lands and increased forest-based livelihood income of about 3 million households living in and around the forests[37]. However, many states are yet to identify landscape-level plans for afforestation and PFM plans, and at the national level both the Green India Mission and NAP have not identified priority landscapes and areas for PFM.

Discussion

India's PFM programmes are not showing the desired result as can be seen from the literature and government audit reports. The objective of PFM should be to maintain healthy forests and improve degraded forests with restoration practices that improve biodiversity and other ecosystem services to support livelihood of forest-dependent communities. This is very essential given India's biodiversity challenges and to achieve mitigation targets like that of INDC.

Planning for PFM activities at landscape level is necessary. Landscapes that are facing high degradation, forest fragmentation and higher forest dependency could be prioritized for PFM. The supreme court by its ruling in 1996 has provided Forest Department with powers to include private land with tree cover, wasteland and degraded land also that are not owned by forest department into its Working Plan[38] which makes it a legally possible option at landscape level planning. Considering landscape as one unit for forest management is essential irrespective of administrative boundaries and legal classification of land. Landscape ecology approaches[39] can be used to spatially identify forest patches and corridors and identify areas that can particularly be improved for habitat connectivity through PFM activities. And degraded and deforested landscapes can be restored with appropriate silviculture techniques that consider biodiversity, climate adaptation and stakeholder needs[40]. Tools like the restoration opportunities assessment methodology (ROAM) developed by WRI and IUCN[41] can help in landscape level PFM planning with inputs of both spatial analysis and stakeholder consultations. Such landscape level approaches can also help in addressing issues of habitat fragmentation and improved connectivity for wildlife[14].

There could be some trade-off on forest management for meeting local community needs against biodiversity or ecosystem services; in such cases landscape level modelling techniques can be used to optimize land use and avoid trade-offs[42]. It may be best to avoid monoculture plantations in biodiversity-rich areas or natural grasslands and do plantations in wasteland to meet the

local fuelwood demand. Stall feeding could be encouraged with fodder productions from wasteland, which could reduce grazing pressure. Considering stakeholder preferences in PFM processes can improve the local participation and PFM outcome[43] and methods like multi-criteria stakeholder preference analysis can be used when there are conflicting stakeholder needs[44]. Such forest management plans drawn from extensive use of spatial, ecological and social assessment needs are rare in India. It can be hoped to change, as the National Working Plan Code, 2014 had made it mandatory to identify in the forest working plan, strategies to improve biodiversity and ecosystem services and to meet the judicial needs of local communities[45].

It is important that PFM models explore potential revenue generating options; this could be in way of plantation in wasteland, sustainable production and marketing of NTFP that can be shared with the communities. It is important that appropriate value chains and market are developed for timber, bamboo and other NTFPs. It is best to identify the value chain of key species, before planning for PFM activities, which can cater to the demand. Under the National Bamboo Mission, extensive plantation of bamboo is taken in central India and bamboo production is assessed to have high economic returns to the PFM communities[46].

India's forest policies do not adequately encourage private sector role in forest development and management. The Lok Vaniki scheme initiated in 1999 by Madhya Pradesh state on encouraging farmers to take up tree plantation in agriculturally not productive lands is one of the earlier attempts on private forestry[47], however, it has not yielded sustainable results in many parts of Madhya Pradesh, mainly due to cumbersome process on getting permission from forest department to harvest timber and lack of access to private timber market[48]. In Himachal Pradesh commercially important timber species like *Cedrus deodara*, are nationalized, wherein the private land owner can sell trees only to Forest Development Corporation, such practices may need revaluation to see if nationalization or denationalizing a species for commercial plantation could improve forest management in private land.

Another important legislation in recent times is the Forest Rights Act, passed in 2008, the act empowers the Gram Sabha with community forest rights and individual rights are recognized with provisions for land allotment. By March 2018, over 5.8 m ha of forest and non-forest land has been diverted and allotted to the right holders[49]. These land parcels can still be explored for models on agroforestry, agri-horti and agri-silviculture that can improve biodiversity, increase carbon sequestration and also provide better economic returns to the tribal land holder. The Biodiversity Diversity Act of 2002 empowers the Gram Sabha to form Biodiversity Management Committees for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats. However, there has been formation of only few biodiversity management committees in India, with exception in Kerala state that has formed Biodiversity Management committees in all 978 village Panchayats. Both the Forest Rights Act and Biodiversity Diversity act have not supported well in PFM despite their huge potential, the provisions of these acts if implemented in right sprit can make immense contribution to improving forest wealth[50]. After the passing of the Panchayats (extension to scheduled areas) act (PESA) 1996 and the forest rights act (FRA) 2006, the states are under pressure to transfer rights over *Tendu* leaf and all other NTFPs to forest-dwellers but no practical approach has been taken[35]. It is important to strengthen forest governance for better PFM outcome as provided in the legal provisions.

It is also important to promote pilot PFM models that are financially viable, ecologically and socially sustainable that can be scaled up at landscape level. Pilot projects should aim at attracting investments from private sector particularly for the management of forests in and around industrial and urban areas in India. REDD + CAMPA (Compensatory Afforestation Fund Management and Planning Authority) funds, and other private investments should be explored in addition to GIM/NAP for scaling up PFM at landscape level. Payment of Ecosystem Services (PES) models could also be explored for financing PFM, however, the capacity gaps in PES valuation methods and institutional mechanisms to facilitate this are limited[51] and need to be strengthened.

Conclusion

PFM in India has high potential to improve biodiversity[52], improve livelihood of local communities[20], climate adaptation and mitigation[53]. There are presently several challenges in PFM on stakeholder engagement, micro planning, sustainable harvest and marketing of timber and NTFP and benefit sharing with local communities. Institutional weaknesses and gaps in legal provisions add to the PFM challenges. The lack of technical capacity, monitoring and reporting, and institutional weaknesses could hurt India's preparedness for REDD+ (ref. 54) and could also hamper achieving the INDC targets under the Paris Agreement. It is estimated that about 9 to 35 m ha of potential wasteland can be used for energy plantations that could create an annual carbon sequestration of about 3–4 million tonnes per ha per year[55] and over 5 m ha of degraded forest[3] can potentially be afforested. PFM provides the opportunity to achieve INDC targets in these lands in addition to improving biodiversity, ecosystem services and livelihood of local communities. To avoid trade-offs and maximize benefits, it is necessary that PFM should be planned at landscape level by using

spatial and ecosystem assessment tools and stakeholder consultations.

The National Forestry Policy 1988 and the National Afforestation Programme although make strong emphasis for PFM, they continue to focus on improving forest cover and use forest cover as an important indicator to evaluate programme success. This has resulted only in plantation drives and not forest development. Both the policy and scheme guidelines need to be revisited for considering the emerging needs on forest management, such as utilization of wastelands, institutional functioning like Forest Development Corporations, Minor Forest Produce Cooperative Federations and Forest Development Agency that have a major role in facilitating sustainable harvest of NTFP and timber, marketing and returning benefits to the JFM communities. Focus should also be on enhancing capacities of forest management agencies on JFM activities on planning, monitoring, evaluation and reporting of JFM activities and outcomes. Research and extension services on PFM are required to be strengthened through State Forest Departments and State Forest Research Institutes given the varying forest types in India, successful region-specific PFM models should be identified and scaled up. The NAP guidelines and NAEB monitoring framework could also consider other indices like biodiversity, NTFP production in tonnes, etc. This would in addition report on carbon sequestration targets, which could help in measuring improvement in health of forest and livelihood support. Other policy interventions such as encouraging private forestry, private sector participation in forest management, grazing restriction, nationalizing certain NTFP and timber species or facilitating sustainable harvest needs to be examined by both the state and central government. It is also important to promote certification of timber and NTFP for sustainability, which can enhance access to global market. Finally, the PFM scheme should move from project based to self-sustaining economic models. Several successful community-based forest management practices have been in India that had no financial investment and were successful only on the basis of people's participation for their valuing of ecosystem services derived from forests and accessing their usufruct rights. The draft National Forest Policy 2018 could also be strengthened to address the current challenges on PFM and improve PFM outcomes.

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