Panel T01-P01 Session 3

Greening state governance: a policy process perspective

Title of the paper

Leveraging Boundary Objects for participatory governance in India's environmental policy process

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Introduction

India's environmental governance has undergone significant evolution over the past few decades, shaped by legislative reforms, judicial interventions, and grassroots mobilizations. Yet, institutional inertia, centralized decision-making, and tokenistic inclusion continue to undermine the transformative potential of participatory approaches. As the country confronts growing ecological crises—ranging from biodiversity loss to climate change—there is an urgent need for governance models that are both ecologically sound and socially inclusive.

Joint Forest Management (JFM) has long been upheld as a pioneering model of decentralized forest governance. However, critical analyses reveal persistent asymmetries in knowledge, power, and access that limit its effectiveness. Community participation often remains procedural rather than substantive, with elite capture, gender and caste-based exclusions, and limited institutional literacy diluting its democratic promise.

This paper investigates the potential of boundary objects as both a conceptual lens and an operational strategy to revitalize participatory governance. Defined as shared artifacts—such as concepts, documents, or practices—that can be interpreted differently across stakeholder groups while maintaining a coherent identity, boundary objects enable flexible coordination without requiring consensus. Drawing on secondary literature, policy analysis, and case studies from West Bengal's JFM program, the paper examines how boundary objects can bridge epistemic, institutional, and social divides in forest governance.

Globally, boundary objects have played a vital role in enabling sustainability transitions in Europe (Franco-Torres et al., 2020), participatory urban planning in Latin America (Davies & Dwyer, 2007), and collaborative forest governance in Africa (Reed & Abernethy, 2009). In these settings, tools such as participatory maps, biodiversity inventories, visual models, and stakeholder reports have served as mediators between state institutions, scientific actors, and local communities. In contrast, their application within India has largely remained conceptual—treated as isolated participatory tools rather than embedded mechanisms of governance (Lele & Menon, 2014).

Building on international scholarship, this paper offers a distinctive contribution by systematically mapping and categorizing boundary objects within the Indian environmental governance context. It identifies and analyses concrete tools—such as biodiversity registers,

participatory maps, and gender-sensitive frameworks—that facilitate communication and coordination among state agencies, communities, and NGOs. Furthermore, it reframes institutions like *Gram Sabhas* and Joint Forest Management Committee (JFMCs), along with artefacts such as Forest Rights Act literacy materials and storytelling practices, as boundary objects of different types: visionary, procedural, documentary, and organizational. Through this dual process of mapping and categorization, the paper advances boundary objects from theoretical constructs to strategic instruments capable of fostering inclusive, adaptive, and context-sensitive governance.

Beyond the forest sector, boundary objects are situated within broader interdisciplinary frameworks where they facilitate structured, iterative collaboration. Tools such as thin definitions, repositories, storytelling practices, and boundary-spanning roles support knowledge exchange, adaptive learning, and the co-production of context-sensitive solutions. Rather than offering a prescriptive model, this paper assesses how boundary objects can help shift participatory governance from symbolic consultation toward genuine power-sharing, communicative equity, and democratic environmental decision-making.

1 - The Evolution and Challenges of Environmental Policy in India: The Need for strengthening Participatory Collaboration

India's environmental policy landscape has evolved significantly over the past several decades, reflecting both a rich historical tradition and responses to modern-day global environmental concerns. This evolution has involved the introduction of legal frameworks, reforms in environmental governance, and a growing emphasis on international cooperation (Purohit, 2020). However, despite this progress, challenges in policy implementation, enforcement, and the need for strengthening community engagement remain (Bhat & Sharma, 2021). The evolution of India's environmental policy is thus a dynamic process, shaped by historical precedents, contemporary challenges. There is a growing recognition of the need for participatory and integrated environmental management approaches.

1.1 Early Foundations and Historical Context of Environmental Policy

India's environmental consciousness is deeply rooted in its ancient texts and practices, which emphasized the interconnectedness between humans and nature (Sahai, 2015). One of the earliest recorded contributions is found in the *Arthashastra* by Kautilya, written between 321–300 BCE. This treatise outlined regulations for managing forests, water bodies, wildlife, and agricultural lands, reflecting an early form of environmental stewardship. Notably, it emphasized participatory resource management, with forest dwellers playing a significant role in conservation efforts (Shamasastry, 2014). This foundational understanding of sustainability laid the groundwork for a cultural ethos that viewed nature as a resource to be preserved wisely.

In modern times, India's environmental policies began to take shape during the mid-20th century as the country addressed pollution and resource degradation amidst post-independence development efforts (Purohit, 2020). The 1950s and 1960s saw the enactment of pioneering laws like the Orissa River Pollution Act (1953) and the Maharashtra Water Pollution Prevention Act (1969). These laws targeted localized issues such as water pollution and deforestation, predating the global environmental movement. However, the rapid industrialization and urbanization of this period posed significant environmental challenges, which lacked national-level coordination (Bhat & Sharma, 2021).

The 1970s marked a turning point for India's environmental governance. The Stockholm Conference on the Human Environment (1972) heightened global awareness and influenced India's constitutional reforms. The 42nd Constitutional Amendment (1976) introduced Articles 48A and 51A(g), mandating both the state and citizens to protect and improve the environment (Purohit, 2020). This decade also saw the institutionalization of environmental governance with the establishment of the National Committee on Environmental Planning and Coordination (NCEPC) in 1972. This later evolving into the Ministry of Environment and Forests (MoEF) in 1985. Key legislation, including the Water (Prevention and Control of Pollution) Act (1974) and the Forest Conservation Act (1980), provided the legal framework to combat environmental degradation (Purohit, 2020).

Biodiversity conservation emerged as a priority during this era. The launch of Project Tiger in 1973 and the Wildlife Protection Act of 1972 marked significant steps in protecting India's

natural heritage. These initiatives established networks of protected areas and curbed the exploitation of wildlife, creating a foundation for India's conservation policies (Purohit, 2020).

The National Environmental Policy (NEP) of 2006 provided a comprehensive framework for integrating environmental considerations into developmental planning. The NEP emphasized sustainable resource use, pollution control, and conservation while advocating for principles such as precaution, sustainability, and the "polluter pays" approach (Bhat & Sharma, 2021). It also highlighted the importance of public participation and institutional capacity building to enforce environmental regulations effectively (Purohit, 2020).

A notable milestone in India's environmental policy that balanced climate action with equity and sustainability (Dubash, 2009; Dubash, 2013; Mohan, 2017a) was the introduction of the 2008 National Action Plan on Climate Change. It outlined eight missions targeting renewable energy, energy efficiency, and afforestation. The renaming of the Ministry of Environment, Forest and Climate Change in 2014, that added climate change to the name, further highlighted the government's commitment to prioritizing climate issues. Efforts such as the International Solar Alliance and the National Solar Policy underscore India's advancements in renewable energy. Though persistent challenges such as land-use conflicts and the continued dependence on non-renewables remain significant (Mohan, 2017b; Ellis-Petersen, 2020).

In recent years, India has implemented progressive policies addressing air pollution, waste management, and climate change. The National Clean Air Programme (NCAP), launched in January 2019, aimed to reduce particulate matter (PM_{10} and $PM_{2.5}$) concentrations by 20–30% by 2024, using 2017 as the baseline. While some cities achieved significant improvements, others fell short of the targets (Press Information Bureau, 2024). Furthermore, legislative initiatives like the Environment (Protection) Amendment Act of 2020 have streamlined industrial clearance processes. This is while addressing emergent environmental challenges, including electronic waste management and the regulation of hazardous chemicals (Chandran, 2017).

1.2 The paradigm shifts to Participatory Management

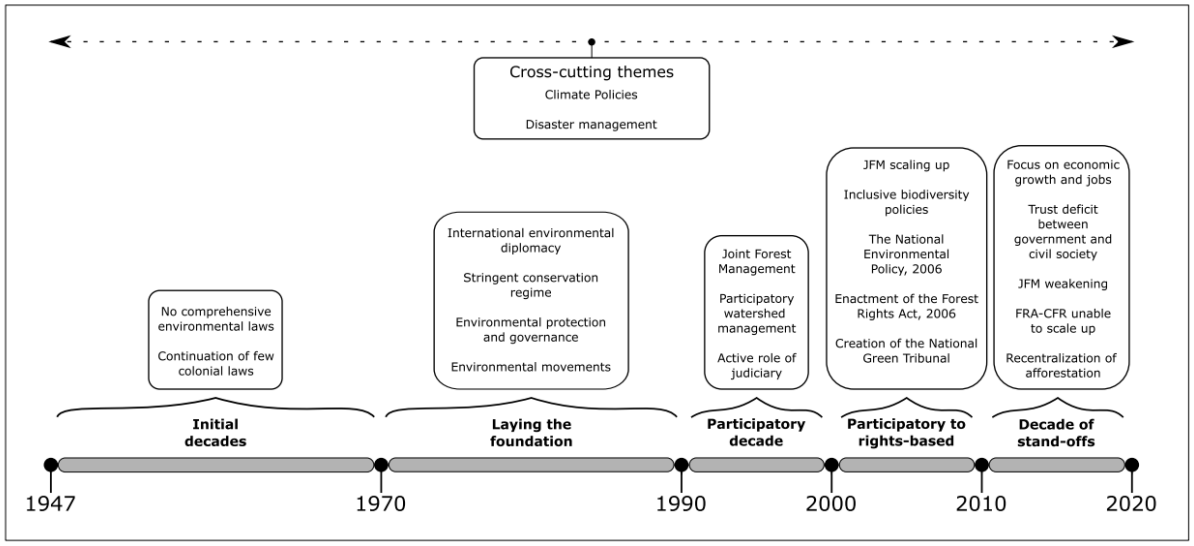


Fig. 1: Evolution of India's environmental policy post-independence

Source: Ballal, Aabha & Tambe, Sandeep & Joe, Elphin. (2021). The Evolution of India's Environmental Policy. Indian Forester. 147. 743-753. 10.36808/if/2021/v147i8/165166.

The trajectory of environmental governance in India underwent a notable transformation in the 1990s, with a paradigm shift towards participatory management. This was driven by grassroots movements, judicial activism, and the recognition of local communities' dependence on natural resources. Ballal, Tambe, and Joe (2021) provide a comprehensive review of India's environmental policy evolution, critically examining key milestones, transitions, and challenges over 75 years of independence. Their analysis highlights how grassroots movements catalysed the transition towards participatory natural resource management, with the Chipko Movement of the 1970s playing a pivotal role. Emerging in Uttarakhand, the Chipko Movement underscored the critical relationship between forests, livelihoods, and ecological balance (Guha & Martinez-Alier, 1997). The movement led the Indian government to impose a 15-year ban on tree felling in the region, setting a precedent for participatory conservation. Its success influenced the National Forest Policy (1988), which explicitly advocated for the inclusion of local communities in afforestation and conservation, thereby acknowledging their resource rights (Ballal et al., 2021). Similar movements, such as the Appiko Movement in Karnataka, echoed these demands for local involvement in conservation initiatives (Shiva, 1988).

Judicial activism further advanced participatory governance, notably through the expansion of Article 21 to encompass the right to a clean and healthy environment. Landmark cases such as T.N. Godavarman Thirumulpad v. Union of India (1996) redefined forests to include community-owned areas, subjecting them to regulated conservation and enabling local participation. Public interest litigation (PIL) emerged as a critical tool for civil society to advocate for environmental justice. These embedding principles such as the Polluter Pays Principle and the Precautionary Principle into governance frameworks (Desai & Sidhu, 2010; Sharma, 2022).

The National Forest Policy (1988) marked a significant shift in prioritizing ecological stability and community needs over revenue generation (Ministry of Environment and Forests, 1988). It called for a mass afforestation movement, culminating in the launch of the Joint Forest Management (JFM) Program in 1990. The JFM institutionalized benefit-sharing mechanisms, fostering partnerships between local communities and the government. Exemplary projects such as the Arabari Project in West Bengal showcased the potential of participatory approaches, where villagers were incentivized through revenue-sharing to restore degraded *sal* forests. Similarly, Haryana's Sukhomajri Project demonstrated the impact of collaborative watershed management in enhancing agricultural productivity and water availability. Projects like Ralegaon Siddhi in Maharashtra further validated the efficacy of participatory watershed management, inspiring the scaling up of such models nationwide (Hobley, 1996; Ballal et al., 2021).

India's commitments at the global level also played a crucial role. The 1972 Stockholm Conference and subsequent ratification of the Convention on Biological Diversity (CBD) emphasized participatory governance. The enactment of the Biological Diversity Act (2002) institutionalized principles of equitable benefit-sharing and recognized indigenous knowledge's value in biodiversity conservation (Mandal & Rao, 2007; Secretariat of the CBD, 1992). The Rio Declaration (1992) reinforced public participation in environmental matters, influencing India's Environmental Impact Assessment (EIA) Notification (1994), which mandated public hearings as part of the clearance process. The Environmental Protection Act (1986) further enabled participatory mechanisms by incorporating the precautionary principle and sustainable development into policy frameworks (Parikh, 2017).

Despite its transformative potential, participatory management in India has faced significant challenges. Many initiatives, such as JFM, lacked statutory backing and relied heavily on executive orders, making them vulnerable to policy shifts. By the 2010s, funding for participatory programs declined, and the discontinuation of the National Afforestation Program (2021) further weakened institutional support. Policies like the Compensatory Afforestation Fund Act (2016) centralized decision-making, often excluding local communities from conservation processes and exacerbating their disenfranchisement (Aggarwal, 2018).

Additionally, recent policies have undermined public participation. For instance, the Draft EIA Notification (2020) limited public hearings to directly affected individuals, excluding NGOs and broader civil society. Public hearings have often been criticized as symbolic, with community inputs rarely influencing final decisions (Parikh, 2017). Conflicts between conservation goals and tribal rights under the Forest Rights Act revealed systemic imbalances, with Community Forest Rights (CFRs) often sidelined in favour of Individual Forest Rights (IFRs). These challenges have eroded trust among local stakeholders, further marginalizing their participation in resource governance (Ballal et al., 2021).

1.3 Challenges in Policy Implementation and Enforcement

Despite the existence of a robust legal framework for environmental protection, the implementation and enforcement of environmental policies in India continue to face significant challenges. Bureaucratic inefficiencies, inadequate monitoring infrastructure, and insufficient resources remain persistent issues (Bhat & Sharma, 2021). Regulatory bodies such as the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) are often hampered by a lack of trained personnel, limited financial resources, and institutional fragmentation. As a result, while environmental laws may exist on paper, their enforcement is often weak, and non-compliance with environmental standards remains widespread (Sharma, 2018).

The challenges of enforcement are compounded by the growing complexity of environmental threats. Emerging pollutants, such as microplastics and e-waste, are not adequately addressed by existing regulatory frameworks, which were designed with older forms of pollution in mind (Chandran, 2017). This gap in regulatory capacity has hindered the ability of agencies to effectively manage new forms of pollution that pose significant risks to public health and

ecosystems. The rapid pace of industrialization, coupled with inadequate oversight, continues to strain the country's environmental governance system (Purohit, 2020).

Political influences and institutional conflicts also play a significant role in undermining environmental regulations. For example, the Coastal Regulation Zone (CRZ) Notification, originally designed to protect India's fragile coastal ecosystems, has been progressively weakened through multiple amendments. These changes reflect the political pressures to prioritize development projects, such as real estate and infrastructure, over environmental protection (Sahai, 2015). Similarly, conflicts between state and central authorities often delay or complicate the approval processes for environmental clearances. State governments sometimes pushing for faster approvals, which may compromise the thoroughness of environmental assessments (Sharma, 2018).

1.4 Historical Context: Top-Down Approaches vs. Distributed Governance

Historically, societal problems were often addressed through top-down governance, where solutions were imposed by strong central authorities based on a defined set of values and beliefs. This approach was designed to create unity and minimize uncertainty by enforcing a standard worldview that was seen as the optimal solution. In the best cases, this approach was informed by scientific evidence and aimed to bring about solutions that would settle debates and enforce collaboration (Sarewitz, 2004; Stirling, 2010). This model worked for simple or well-defined societal challenges (Pahl-Wostl et al., 2011), where the solutions were largely undisputed and easy to implement.

However, as the nature of societal challenges has evolved, it has become clear that wicked problems cannot be solved through rigid top-down approaches. In modern society, the complexity, uncertainty, and interdependence of problems like climate change or biodiversity loss require a new governance paradigm—one that embraces diversity, flexibility, and adaptation. The recognition that we cannot rely on fixed, universal solutions points to the need for governance that is distributed across a wide array of stakeholders. Each stakeholder with different knowledge systems, values, and priorities (Kooiman, 2003; Sørensen & Torfing, 2016).

1.5 The Need to strengthen Participatory Collaboration in Environmental Governance

A key aspect of improving environmental governance in India is the need for more inclusive and participatory decision-making processes (Purohit, 2020). Many environmental policies in India have been formulated at the national level, with little engagement from local communities. Those whose livelihoods and well-being are often most directly affected by environmental changes. Forest communities, particularly indigenous groups such as the *Adivasis*, often find their rights overlooked in favour of large-scale development projects like mining or infrastructure construction. These top-down approaches to environmental governance tend to neglect local knowledge and perspectives, which are crucial for crafting effective and sustainable environmental policies (Bhat & Sharma, 2021).

Participatory collaboration can help bridge the gap between national policy frameworks and local realities. This approach involves not only government agencies but also local communities, civil society organizations, and other stakeholders in the decision-making process. Local communities, particularly those directly dependent on natural resources, possess valuable knowledge of their environment and are often best positioned to identify effective solutions to local environmental problems. Involving these communities in environmental decision-making processes can lead to more context-specific policies and a greater sense of ownership and responsibility for environmental outcomes (Sharma, 2018).

Case studies of environmental management in India, such as in the Nilgiris and Darjeeling districts, have shown that disaster risk management policies, while existing at the national level, often fail to be effectively implemented at the local level. This is due to institutional inertia and a lack of engagement with local populations (Chandran, 2017). Shifting from a top-down approach to a more participatory model is essential for enhancing the effectiveness of disaster risk reduction (DRR) and environmental management efforts (Bhat & Sharma, 2021).

2. The Potential of Boundary Objects in Facilitating Participatory Collaboration

Participatory collaboration in environmental policy process is critical for promoting sustainability and ensuring that the needs and rights of local communities are respected in decision-making processes. In India, despite numerous policy frameworks supporting

community participation, challenges such as institutional inertia, political interference, socio-cultural exclusion, and capacity gaps at the local level continue to undermine its. Boundary objects offer a powerful solution to these challenges by facilitating communication and knowledge exchange across diverse stakeholder groups. Boundary objects play a central role in fostering inclusive, transparent, and effective environmental governance in India. They democratize knowledge, promote inclusion, enhance transparency, and bridge gaps between national policies and local realities.

The concept of boundary objects has developed substantially over the past five decades, shaped by interdisciplinary debates across science and technology studies, organizational theory, and sustainability transitions. Its intellectual trajectory can be traced to Rittel and Webber's (1973) formulation of wicked problems, which framed certain policy challenges as inherently complex and resistant to resolution through linear, expert-driven solutions. This insight catalysed calls for collaborative, adaptive modes of governance. Subsequently, Gieryn's (1983) notion of boundary work explored how scientific authority is maintained through rhetorical and institutional practices that demarcate science from non-science, foreshadowing later interest in the negotiation of knowledge across domains.

A major conceptual turning point emerged with Star and Griesemer's (1989) introduction of the term boundary objects during their ethnographic study of the Berkeley Museum of Vertebrate Zoology. They identified these as artifacts—such as maps or museum specimens—that facilitate cooperation among actors from different "social worlds" by being simultaneously plastic enough for interpretive flexibility and robust enough to maintain identity across contexts. This dual quality allows boundary objects to support coordination without requiring consensus. Complementary insights from Lave and Wenger (1991) and Brown and Duguid (1991) advanced the idea of communities of practice, wherein informal, practice-based learning groups operate as dynamic boundary spaces for sharing tacit knowledge.

The capacity of boundary objects to mediate knowledge was further systematized by Nonaka's (1994) SECI model, which identified processes of socialization, externalization, combination, and internalization in organizational knowledge creation—processes in which boundary objects play a crucial translational role. In environmental governance, the early 2000s marked a shift from conceptual elaboration to empirical application. Cash and Moser (2000) recognized how

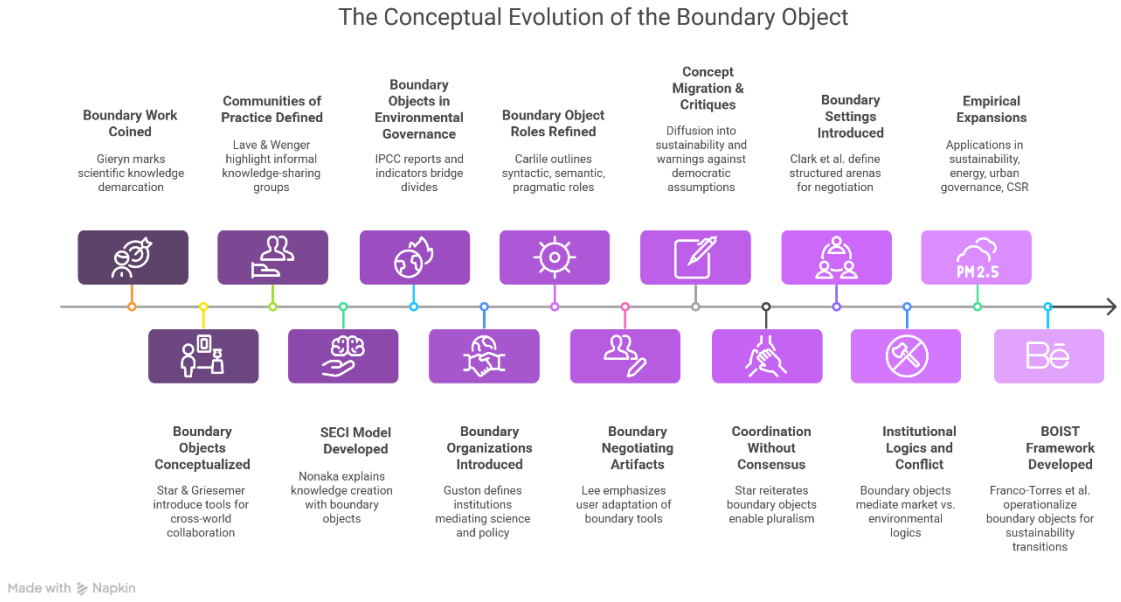
IPCC reports function as boundary tools between scientific and policy communities, while Cash et al. (2003) emphasized indicators and participatory platforms as mechanisms that facilitate knowledge exchange across disciplines. The concept of boundary organizations, introduced by Guston (2001), added an institutional layer by identifying structured entities that straddle science-policy interfaces, balancing salience, credibility, and legitimacy.

Further refinement came from Carlile (2004), who categorized the functions of boundary objects into three domains: syntactic (establishing shared language), semantic (negotiating meaning), and pragmatic (enabling conflict resolution). Building on this, Lee (2007) emphasized boundary negotiating artifacts, foregrounding the role of users in shaping and adapting these tools. Between 2009 and 2010, the conceptual terrain expanded through work by Trompette and Vinck, who traced the migration of boundary objects into organizational and sustainability theory, and by Turnhout and Turnbull, who cautioned against uncritical assumptions of their inclusivity or neutrality. Star (2010) reinforced the original insight that boundary objects coordinate without homogenizing difference, maintaining epistemic pluralism.

Subsequent developments explored how these tools mediate institutional logics and governance arrangements. Clark et al. (2011) proposed boundary settings—structured arenas for inter-sectoral negotiation. By 2014–2015, researchers such as Fuenfschilling and Truffer, Smink et al., and Besharov and Smith examined how boundary objects can reconcile or manage tensions between competing institutional logics, such as environmental and market-oriented goals. Empirical studies between 2016 and 2019—including work by Pel (2016), Wittmayer et al. (2017), van der Jagt et al. (2019), and Pan Fagerlin et al. (2019)—demonstrated their application in diverse domains such as sustainability experimentation, energy transition, CSR, and urban governance.

A significant theoretical consolidation emerged with Franco-Torres, Rogers, and Ugarelli's (2020) BOIST framework (Boundary Objects in Sustainability Transitions), which identified boundary tools as crucial mechanisms for navigating competing logics, mobilizing cognitive and material resources, and articulating shared selection pressures. This framework connects boundary object theory with the multi-level perspective on sustainability transitions, positioning them as strategic instruments in shaping systemic transformation. Yet, as noted by

Bechky (2003), Fox (2011), and Lounsbury and Glynn (2001), boundary objects are not inherently democratic or benign; their design and function reflect power dynamics and the politics of participation. Thus, the contemporary understanding of boundary objects emphasizes both their utility in managing complexity and their embeddedness within broader struggles over meaning, legitimacy, and inclusion.



Boundary objects play a crucial integrative role in sustainability transitions by enabling collaboration across diverse stakeholders grappling with complex, interconnected environmental challenges such as climate change and biodiversity loss. Their inherent flexibility allows different actors to adapt shared concepts—like "sustainability" or "green innovation"—to their own priorities while maintaining a common reference point, thus fostering co-produced, context-sensitive solutions. In India's participatory environmental governance, which is often hindered by centralized bureaucracies, elite capture, and socio-cultural exclusion, boundary objects offer a way to bridge institutional and epistemic divides. Tools such as participatory maps, visual land-use plans, and biodiversity registers have allowed communities to engage with technical data, assert local knowledge, and influence policy processes more meaningfully. For instance, in the *Narmada Bachao Andolan*, participatory mapping was used to visually communicate the social and ecological costs of dam construction, challenging dominant state narratives and mobilizing wider support (Roy, 1999). In Odisha,

village-level climate adaptation planning under the Mahanadi River Delta initiative utilized participatory vulnerability assessments to align local priorities with state climate strategies (Sethi, 2019). In Madhya Pradesh, forest-dwelling communities used simplified biodiversity registers to monitor forest degradation and advocate for better protection (Kumar & Singh, 2021). Additionally, gender-sensitive tools like role-mapping exercises have highlighted women's contributions to water management, making their roles visible in decision-making processes (Agarwal, 2010). By translating complex scientific and policy language into accessible formats, boundary objects help shift participatory governance from symbolic consultation to substantive engagement rooted in co-production, transparency, and iterative learning.

3. Understanding the work of Boundary Objects in the cases of participatory natural resource management – The Case of West Bengal Joint Forest Management

Joint Forest Management (JFM) in West Bengal serves as a compelling case for understanding participatory governance through the concept of boundary objects, offering a nuanced lens through which to examine how institutions mediate between diverse social worlds. West Bengal's experience with Joint Forest Management (JFM) is more than a policy intervention; it represents a vivid narrative of institutional experimentation shaped by conflict, cooperation, and community resilience. Initiated in 1973, the Arabari experiment in Midnapore marked the state's first step toward inclusive forest governance. Before this, forest management followed a centralized regime, with professional foresters prescribing conservation policies with minimal or no input from the communities living in and around the forests. This top-down approach led to alienation and unsustainable forest use, as local populations, deprived of legal access, turned to the forests for survival (Gadgil & Guha, 1995).

A major shift began when A.K. Banerjee, a senior forest officer, launched a pilot project inviting villagers to protect *sal* forests in exchange for usufruct rights. This allowed them to collect non-timber forest products and, crucially, to share in timber sale revenues. The initiative gave rise to Forest Protection Committees (FPCs), local forums for forest co-management. For the villagers, this arrangement signified more than material benefits; it acknowledged their traditional roles as forest stewards and re-established their legitimacy within forest governance.

JFM is lauded as a model case for participatory environmental governance to be replicated across the country. However, emerging at the intersection of state authority, local community practices, scientific forestry, and international conservation agendas, JFM naturally acts as a site of continuous negotiation where power struggles are embedded in participatory processes. While official rhetoric celebrates inclusivity and co-management, ground realities often reveal tokenistic participation, elite capture, and the marginalization of indigenous knowledge systems.

The JFM model rapidly gained traction. By 2001, more than 1,250 FPCs were managing over 150,000 hectares of forest land (Saxena, 2001). Today, the model has scaled across West Bengal, institutionalizing participatory mechanisms through over 4,300 committees, with SC/ST communities forming more than half of the membership. These figures point not only to bureaucratic expansion but also to a transformation in the relationship between the state and forest-dependent communities. The Joint Forest Management (JFM) program in West Bengal offers a vivid example of both the potential and the pitfalls of participatory environmental governance. However, if we understand these tools of participatory governance through the conceptual understanding of boundary objects, we may be able to enhance its impact rightfully.

3.1 Reimagining the Forest as a Visionary Boundary Object to Challenge Rigid Developmental Views

At the outset, JFM aimed to foster a shared goal of sustainable forest management, yet this vision frequently remained rhetorical. Asymmetrical power relations undermined the development of genuine collective alignment (Baviskar, 2003; Chhatre & Agrawal, 2008). Although conceptually flexible, the forest failed to generate shared ownership or motivation among marginalized groups. The state's technocratic, afforestation-driven vision of sustainability—prioritizing ecological indicators over local values—did not adequately incorporate diverse forest ontologies, thereby weakening the boundary object's integrative potential (Lele et al., 2010).

Nonetheless, the forest holds potential to be reimagined as a visionary boundary object—a shared symbol capable of mediating between diverse stakeholder perspectives and interests.

Historically, the state has framed forests through the lens of national development and conservation, while local communities have viewed them as essential sources of livelihood and cultural identity. Reframing the forest to incorporate both conservationist and sustenance-oriented perspectives can help translate divergent worldviews into a more unified vision of sustainable management (Callon, 1984; Carlile, 2004). In this redefinition, the forest becomes a dynamic, negotiable concept capable of aligning institutional and community goals (Stirling, 2011; Koehrsen, 2017a; Lele & Menon, 2014). Such a reconceptualization fosters collaboration by offering a flexible interpretive space that accommodates multiple values and knowledge systems (Star & Griesemer, 1989).

However, realizing this potential requires defining the forest in more adaptable, "thinner" terms. Current practices often impose a rigid, state-centric conception, especially in JFM programs where afforestation projects prioritize fast-growing commercial species like eucalyptus and acacia. These choices frequently ignore community-preferred native species such as sal and mahua, which are ecologically, economically, and culturally significant to forest-dependent populations (Sarin et al., 2003; Menon & Bijoy, 2012). This over-definition by dominant actors restricts the forest's interpretive flexibility—one of the key qualities that make boundary objects effective (Star, 2010). For the forest to function meaningfully in participatory governance, it must allow for local adaptation and plural interpretations. More than translating perspectives, this process must emphasize the co-production of knowledge, wherein scientific, policy, and indigenous understandings are jointly developed through sustained engagement and mutual respect (Jasanoff, 2004; Turnhout et al., 2012). Co-production repositions local communities as active knowledge-makers, ultimately fostering more equitable and context-sensitive environmental management.

Table 5.2. Changes in objectives of forest management before and after 1988

Before 1988	After 1988
market	subsistence
end products	intermediate products
one time	recurrent
timber from dead trees	non-timber from living trees
monoculture	poly-culture
single purpose	multi-purpose and multi-layer
felling	gathering

Source: Dubey and Singh 1994

Source: The Saga of Participatory Forest Management in India. (n.d.). Semantic Scholar. Retrieved from https://pdfs.semanticscholar.org/5687/fbf99d55ed982e2a5e4527bf5a1222f93668.pdf

Tool Type	Boundary Object Tool	Description / Function	Theory
Visionary Boundary Object	Reimagined forest	Mediates diverse worldviews, emotionally and aspirationally resonant	Olesen (2017), Stirling (2011)
Boundary work / co-production	Process of knowledge integration	Reframes meanings through joint engagement across science, policy, and local knowledge	Jasanoff (2004), Turnhout et al. (2012)

3.2 Gender-Sensitive Frameworks as Boundary Objects to Address Token Representation

A gender-sensitive framework holds significant potential as a boundary object in participatory forest governance, particularly within Joint Forest Management (JFM) programs in West Bengal. These frameworks serve not just as tools for inclusion but as platforms that mediate

between institutional mandates and the lived experiences of marginalized groups—especially women. Since the early 1990s, JFM initiatives have established separate female forest management units to institutionalize women's participation, recognizing their distinct needs, knowledge systems, and resource use patterns. These women-exclusive units have shown higher engagement levels than general JFM bodies and have directly contributed to household livelihoods through forestry activities (Das, 2011). The Ministry of Environment and Forests reinforced this approach through its 2000 notification, which formalized gender participation, conflict resolution, and reinvestment provisions within JFM structures.

For gender-responsive frameworks to function effectively as boundary objects, implementation must move beyond formal inclusion to genuine power-sharing. While these frameworks offer a platform for diverse voices, their transformative potential is often limited by elite capture. Women, Scheduled Tribes (STs), and landless communities are frequently included nominally, with little real influence over decision-making (Agarwal, 2001; Sarin et al., 2003). These exclusions, shaped by gender and caste hierarchies, undermine the participatory goals of JFM. Fieldwork by Basu (2021) in Purulia shows that while women made up 40% of Forest Protection Committee (FPC) executive members, active participation in meetings was as low as 17% in some areas. Similarly, landless SC/ST households, despite high dependence on forest resources, remained marginalized in benefit-sharing. In the Sundarbans, women reported being "members on paper," without a substantive role in decisions. As one participant noted, "I go to the forest every day for firewood, but no one asks me how the forest is doing or what we need" (Chandra & Mukhopadhyay, 2021).

Addressing these inequities requires institutional mechanisms that ensure real power-sharing—such as reserving leadership positions for women and tribal members, implementing rotational governance, and ensuring fair benefit distribution. In Nayagram, West Midnapore, a JFM Committee adopted a biennial leadership rotation policy that eventually enabled tribal women to voice concerns about resource access and benefit allocation (Gupta & Koontz, 2019). Culturally relevant leadership development and gender-sensitive training programs can further strengthen the agency of underrepresented groups, moving beyond tokenism toward meaningful engagement. As Agarwal (2010) argues, true inclusion is measured not by presence alone but by the ability to influence outcomes. When embedded strategically into JFM, gender-sensitive

approaches can help transform participatory governance into a more equitable and collaborative process.

Tool Type	Boundary Object Tool	Description / Function	Theory
Specified Boundary Object	Gender-sensitive frameworks	Translate policy into situated practice, such as reserving leadership positions for women and tribal members, implementing rotational governance, and ensuring fair benefit distribution.	Star & Griesemer (1989), Carlile (2002)

3.3 Bridging Transparency Gaps in JFMCs through Documentary and Deliberative Boundary Objects

Transparency deficits continue to pose significant challenges within many Joint Forest Management Committees (JFMCs). Financial records are often managed without adequate disclosure, and decision-making processes remain opaque to the broader membership (Bhattacharya et al., 2010). Village meetings, when held, are infrequent or dominated by local elites, reinforcing hierarchical modes of governance. Despite formal structures of participation, many community members experience these spaces as symbolic. As a woman from Kaikhali village in the Sundarbans explained, “We are called to meetings, but decisions are made before we even speak. The officer tells us what to do” (Chandra & Mukhopadhyay, 2021). Her testimony reflects how procedural inclusion is often constrained by existing power dynamics.

Empirical findings further illustrate this disconnect. A 2020 study of ten JFM villages in the Ranibandh Range of Bankura (South) surveyed 228 households using structured questionnaires to develop participation indices across forest management stages. The overall participation index was 0.47. While engagement in implementation activities—such as tree planting and meeting attendance—was relatively high (implementation index: 0.589), participation in monitoring was much lower (monitoring index: 0.342), indicating limited involvement in oversight. The highest levels of engagement were in committee elections (0.814) and meeting attendance (0.908), yet these remained largely procedural. Kalabani village recorded the lowest

overall participation (0.369), reflecting consistently weak engagement across all stages (Ghosh & Basu, 2021).

To address these gaps, practical mechanisms such as public display of financial records, meeting minutes, and benefit-sharing details on village notice boards can improve transparency. In Jharkhand, the NGO PRADAN introduced "Forest Registers" to document financial transactions and governance decisions, which increased trust and curtailed mismanagement (Springate-Baginski & Blaikie, 2007). These registers can be seen as documentary boundary objects—similar to People's Biodiversity Registers under the Biological Diversity Act (2002)—that link local knowledge with institutional frameworks. Applied to JFMCs, such tools could foster accountability and more legitimate participation.

Establishing independent monitoring through NGOs or local self-help groups (SHGs) can further enhance oversight. Periodic social audits, modelled on Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) practices, can expose discrepancies and build trust (Dey & Bandyopadhyay, 2022). These audits could take inspiration from the Environmental Impact Assessment (EIA) framework, where public hearings and reports act as deliberative boundary objects, helping communities engage with technical data. Similarly, JFMCs could institutionalize annual village-level audits using simplified visual formats to ensure accessible and democratic financial oversight.

Tool Type	**Boundary Object Tool**	**Description / Function**	**Supporting Theory**
Documentary Tool	Forest Registers	Community-maintained logbooks of financial transactions and decisions; enhance transparency and trust within forest user groups.	*Specified boundary objects* as standardized forms and repositories (Star & Griesemer, 1989; Carlile, 2002)
Documentary Tool	Notice Board Postings	Public display of minutes, budgets, and benefit-sharing allocations; increase access to	*Standardized communicative artifacts* for transparency and cross-group legibility (Star, 2010)

Tool Type	Boundary Object Tool	Description / Function	Supporting Theory
		information and promote inclusive governance.	
Participatory Monitoring	Social Audits	Community-driven oversight mechanism (e.g., inspired by MGNREGA); enable collective scrutiny of financial and operational activities.	*Deliberative boundary objects* for participatory governance (Stirling, 2011; Cash et al., 2003)
Actor-Based Arrangement	NGO / SHG Monitoring	External facilitators who act as intermediaries between communities and state agencies; support accountability and reduce elite capture.	*Boundary spanners* who mediate between institutional domains (Williams, 2002; Levina & Vaast, 2005)
Institutional Setting	Village Meetings	Forums for dialogue and decision-making; can evolve into co-productive, deliberative spaces if reformed beyond symbolic inclusion.	*Boundary settings* as structured arenas for knowledge negotiation and power-sharing (Mollinga, 2010; Turnhout et al., 2016)

3.4 Addressing Knowledge Asymmetry through Boundary Spanners in Forest Management

One of the most overlooked aspects of Joint Forest Management (JFM) in West Bengal is the persistent knowledge asymmetry between forest department officials and local forest-dependent communities. This gap is exacerbated by administrative practices such as zoning—particularly the core-buffer delineation in protected areas—which often conflict with local spatial understandings and lived experiences. Unlike the rigid territorial classifications imposed by the state, local communities perceive forests as seamless extensions of agricultural lands,

ritual spaces, and daily life. The enforcement of fixed boundaries not only undermines customary access but also disrupts ecological sensibilities and adaptive capacities.

This friction was particularly evident after Cyclone Amphan in 2020, which severely disrupted traditional livelihoods and erased physical markers like fencing in parts of the Sundarbans. Villages such as Jharkhali and Satjelia faced increased vulnerability due to rising salinity, declining fish and crab catches, and intensifying human-wildlife conflict. As one crab collector poignantly stated, "We have no land left. There are no prospects for life here. Entering the forest braving the tigers or staying hungry—we would die both ways" (Ghosh et al., 2021). These accounts underscore the need for conservation frameworks that are ecologically informed and responsive to the socio-economic realities and cultural attachments of forest-dependent communities.

In regions like Jangal Mahal, where biodiversity and indigenous knowledge are deeply intertwined, traditional ecological knowledge (TEK) continues to guide conservation practices. Communities embed biodiversity within seasonal agricultural cycles and religious rituals, attributing sacred value to species such as mango, palash, and neem. As Siddique et al. (2022) note, "For millennia, the interactions between them and the natural world have formed traditional ecological knowledge... to protect and benefit one another." Despite this, formal forest management often marginalizes such perspectives in favour of technocratic interventions, particularly through afforestation programs that prioritize fast-growing, commercially valuable species like eucalyptus and acacia to meet carbon market goals.

In Bankura, these plantations have displaced native vegetation, diminished groundwater reserves, and limited access to key forest products like sal leaves, mahua flowers, and medicinal herbs—resources vital to both subsistence and cultural identity (Lele & Menon, 2014). This is compounded by limited institutional literacy among JFMC members—particularly women and marginalized forest dwellers—regarding forest ecology, their rights under the Forest Rights Act (2006), and the procedural workings of JFM bodies. This lack of awareness curtails their participation and reinforces dependency on forest department officials.

To address these challenges, regular and context-specific training in sustainable forest management, legal rights, and financial literacy is essential. In states like Odisha and Chhattisgarh, seasonal workshops facilitated by civil society organizations and forestry

extension services have helped bridge these knowledge gaps (Behera, 2009). In Purulia, the Tagore Society for Rural Development collaborated with forest officials to build capacity among women's self-help group (SHG) members, empowering them to take leadership roles in afforestation efforts. These individuals often act as boundary spanners—translating bureaucratic knowledge into local idioms and vice versa—similar to the role played by local leaders in Seva Mandir's wasteland development programs in Rajasthan.

Formalizing and supporting such intermediaries, especially SHG leaders and youth volunteers, can enhance communicative equity and strengthen the legitimacy of forest governance in West Bengal. Additionally, storytelling methods—such as those used by Seva Mandir to circulate success stories through community meetings and visual media—can serve as emotional and symbolic boundary objects. These narratives foster shared meaning across diverse stakeholder groups and inspire the replication of locally effective practices within and across JFMCs.

Tool Type	**Boundary Object Tool**	**Description / Function**	**Supporting Theory**
Actor-Based Arrangement	SHG Leaders / Local Intermediaries	Function as *boundary spanners*, translating state policy, ecological knowledge, and legal provisions into locally understandable terms, and vice versa, fostering communicative equity in forest governance.	Boundary spanners as relational agents between knowledge systems (Williams, 2002; Levina & Vaast, 2005)
Training & Capacity Tool	Seasonal Workshops / Legal Literacy Programs	Capacity-building platforms that transfer institutional and ecological knowledge to marginalized communities, enabling informed participation in forest governance.	*Boundary settings* for knowledge exchange and institutional learning (Mollinga, 2010; Turnhout et al., 2016)

Tool Type	Boundary Object Tool	Description / Function	Supporting Theory
Narrative / Symbolic Tool	Storytelling & Success Narratives	Emotional and symbolic boundary objects used to create shared meaning, motivate collective action, and inspire replication of best practices across communities.	Visionary and symbolic boundary objects that align goals through narrative (Lounsbury & Glynn, 2001; Olesen, 2017)
Knowledge Tool	Traditional Ecological Knowledge (TEK)	Embodied local ecological wisdom that provides alternative ontologies and conservation strategies, which if institutionally recognized, can function as a bridge between formal science and local practice.	Epistemic boundary object connecting indigenous knowledge with institutional frameworks (Star & Griesemer, 1989; Cash et al., 2003)
Documentary Tool	Forest Rights Act (FRA) Literacy Materials	Legal boundary objects that help interpret formal entitlements (like land or access rights) in ways that can be integrated into local understandings and claims-making processes.	Legal boundary objects enabling claim negotiation (Jasanoff, 2004; Carlile, 2004)

3.5 Using Procedural, Repository, and Organizational Boundary Objects to Counter Elite Capture

Elite capture—the monopolization of Forest Protection Committees (FPCs) by socio-economically dominant actors—remains a pervasive challenge within Joint Forest Management (JFM) in West Bengal (Sundar, 2000). Across the state, FPCs are often steered by local elites such as schoolteachers, ex-panchayat leaders, and upper-caste landowners who dominate

decision-making processes, secure preferential access to benefits and contracts, and cultivate political patronage networks (Datta, 2021). In such contexts, participatory processes are frequently symbolic rather than substantive. Community meetings and training sessions are typically ritualized events, marked by scripted presentations, formal resolutions, and choreographed displays of inclusion. As Baviskar (2003) observes, "Participation is reduced to a ritual of consultation, where decisions are pre-made, and dissent is defused through procedure."

This performative inclusion is underpinned by a broader epistemic politics that privileges scientific forestry over local ecological knowledge. As global afforestation efforts become increasingly tied to carbon markets and technical metrics, indigenous and community-based knowledge systems are often sidelined. Based on recent assessments, community concerns in Bankura over forest regeneration appear to be grounded in observable ecological decline. Studies have documented that several forest plots in the Joypur and Beliatore ranges lack adequate growing stock, with many areas dominated by shrub growth or remaining barren (Das, 2021). Geospatial analyses further reveal that despite ongoing afforestation initiatives, forest cover in Bankura has become increasingly fragmented and degraded over time (Dutta, Chatterjee, & Dey, 2021). These findings suggest a disconnect between official claims of regeneration and local perceptions, particularly where declining soil quality and diminished access to essential forest products affect forest-dependent livelihoods.

Addressing this entrenched elite capture requires institutional safeguards that democratize governance structures. Measures such as mandatory leadership rotation, inclusive electoral processes, and independent third-party audits can help level the playing field. The Arabari model—one of India's most celebrated JFM success stories—began to show signs of stagnation until leadership reforms were introduced in the early 2000s to diversify representation and accountability (Poffenberger & Singh, 1996). Similarly, empowering *Gram Sabhas*—acting as boundary organizations that connect state and local representatives—with statutory authority to oversee FPCs can improve transparency and promote community-driven decision-making. Gram Sabhas are not formally designated as governing bodies under Joint Forest Management (JFM) at the national level—but they have an increasingly significant oversight and participatory role in many state-level implementations, especially after the Forest Rights Act

(2006). Odisha, Maharashtra, and Chhattisgarh have issued orders directing that JFMCs be restructured as sub-committees of the Gram Sabha (Government of Odisha, Forest and Environment Department, 2011; Government of Maharashtra, Revenue and Forest Department, 2012). In West Bengal, however, JFM largely continues to function through FPCs/JFMCs without strong Gram Sabha integration. Tools such as formal benefit-sharing agreements—akin to those used in Sukhomajri or in the Jeevani herbal knowledge case involving the Kani tribe—can function as procedural boundary objects. By linking leadership accountability and transparency to the equitable distribution of profits from non-timber forest products (NTFPs) or eco-tourism, such agreements can align governance incentives with community welfare.

At the heart of this challenge lies a structural contradiction: while JFM is framed as a participatory initiative, ultimate authority over forest management plans and benefit-sharing continues to rest with the forest department. Scholars such as Lele (2015) have argued that this imbalance renders community involvement largely consultative rather than decision-making in nature. A more transformative reform would involve reconfiguring legal frameworks to vest greater authority in community institutions. Recognizing *Gram Sabhas* as the primary decision-making bodies for forest governance—as enabled under the Forest Rights Act (2006) and operationalized in parts of Maharashtra and Odisha (Kumar & Kerr, 2012)—offers a viable model. West Bengal could pilot similar approaches in its tribal-majority districts, where customary institutions and forest dependence are deeply entrenched.

The Van Panchayat system in Uttarakhand provides a compelling institutional precedent. As decentralized forest councils with legal recognition, Van Panchayats serve as boundary organizations that bridge state regulation with grassroots autonomy. Drawing inspiration from this model, JFMCs in West Bengal can be restructured to operate as empowered, democratically accountable institutions that not only co-manage forests but also negotiate the interface between ecological sustainability and social justice.

Financial opacity and uneven benefit-sharing often erode community trust. Mandatory public disclosures, supported by accessible formats (e.g., wall charts, pictorial records), can strengthen legitimacy. Annual independent audits and feedback loops—perhaps facilitated by Panchayati Raj Institutions—could ensure wider accountability. In the JFMC of Jhargram, an NGO-facilitated audit process involving SHGs led to restructuring of benefit-sharing norms to include

forest laborers and women fuelwood collectors, thus reducing intra-village tensions (Mukherjee & Saha, 2021). To enhance this process, tools like community-managed resource repositories—as seen in seed banks and nurseries in Rajasthan—can serve as shared infrastructure boundary objects. These physical spaces embody collaborative values and ensure continuity in sustainable resource management. Furthermore, repository boundary objects, like localized knowledge databases or inventories of forest produce, can preserve and share community expertise, grounding future planning in lived experience.

Tool Type	Boundary Object Tool	Description / Function	Supporting Theory
Organizational Structure	*Gram Sabhas* as Boundary Organizations	Function as intermediary institutions connecting state agencies and local communities; enhance legitimacy by democratizing forest governance and enabling co-decision-making.	Boundary organizations mediating science, policy, and local action (Guston, 2001; Cash et al., 2003)
Procedural Tool	Formal Benefit-Sharing Agreements	Procedural boundary objects that align community incentives with governance reforms, clarifying rules for profit distribution and collective accountability.	Procedural boundary objects facilitating cooperation (Carlile, 2002; Star & Griesemer, 1989)
Organizational Reform	Mandatory Leadership Rotation / Inclusive Elections	Tools that prevent elite capture and institutional stagnation by structuring power-sharing through rotating roles and electoral legitimacy.	Governance reforms as structural boundary-setting (Mollinga, 2010; Fung & Wright, 2003)
Audit Tool	Annual Independent	Transparency-enabling boundary objects that expose financial	Accountability through documentary boundary

Tool Type	Boundary Object Tool	Description / Function	Supporting Theory
	Audits + Public Disclosures	flows and decision-making outcomes in accessible formats (e.g., wall charts, pictorial records), increasing institutional accountability and public trust.	objects (Turnhout et al., 2016; Fox, 2007)
Infrastructure Tool	Community-Managed Repositories (e.g., seed banks)	Physical boundary objects that embody collective ownership, support sustainable resource use, and institutionalize community knowledge and practice in everyday governance.	Repositories as material boundary objects (Star & Griesemer, 1989; Trompette & Vinck, 2009)
Knowledge Tool	Local Resource Inventories / Databases	Documentary tools that preserve and circulate traditional ecological knowledge (TEK), fostering continuity in conservation planning and resistance to elite-driven narratives.	Epistemic boundary objects linking knowledge systems (Jasanoff, 2004; Leach, Scoones, & Wynne, 2005)
Institutional Prototype	Van Panchayat System (as Model)	An institutional boundary object providing a precedent for decentralized governance, demonstrating how legal autonomy can integrate ecological, cultural, and democratic values in forest management.	Institutional boundary objects that scale governance learning (Cash et al., 2003; Pahl-Wostl, 2009)

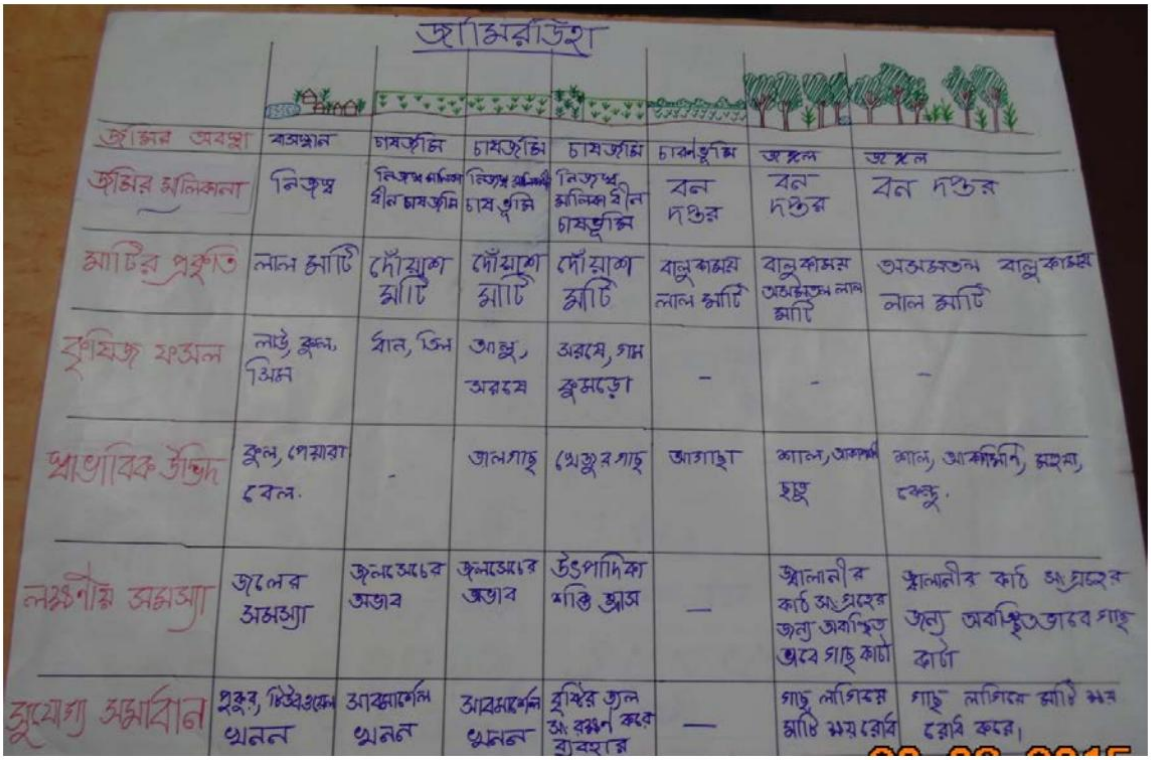
Minimum content:
Location and list of village households, main occupation, whether landed or landless, identification of vulnerable households, location of the field/forest boundaries, existence of social groups, assessment of nature and extent of dependence on natural resources for sustenance of livelihoods

An example of social map prepared by the villagers of Jamkanali

An example of resource map prepared by the Jamirdiha JFMC members

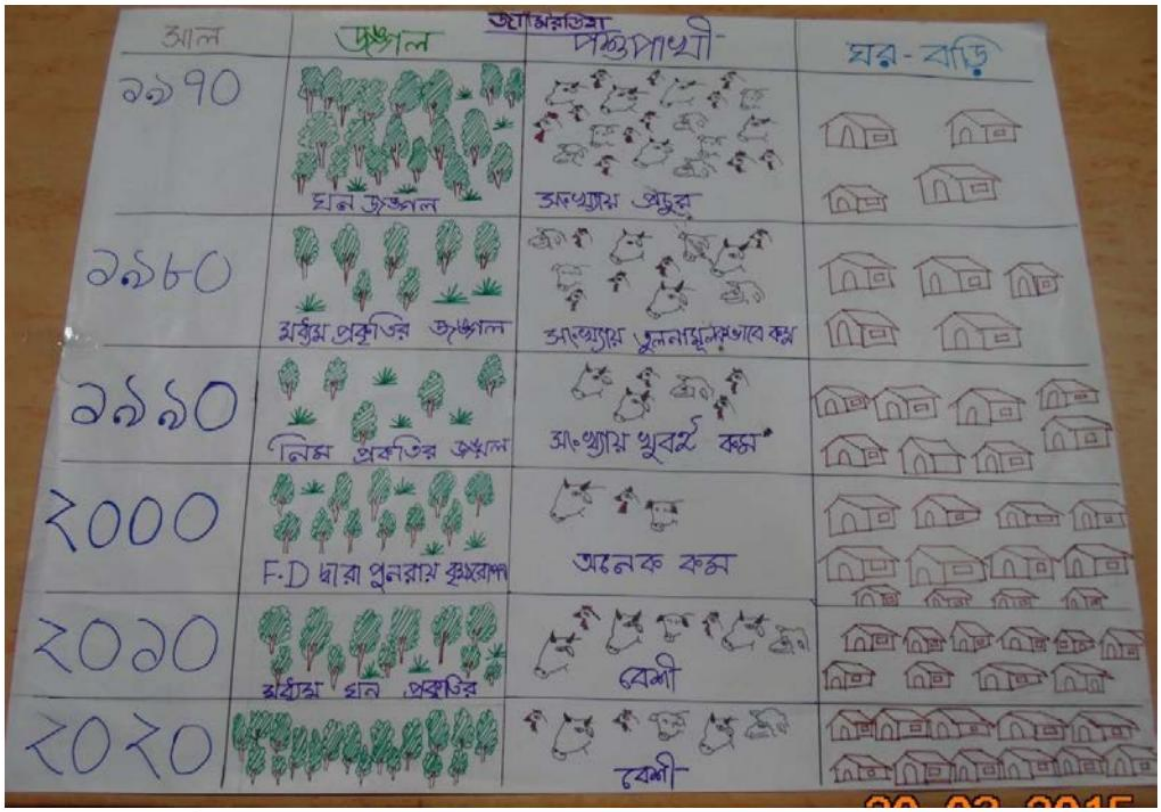
PRA exercise at Ranibandh, Bankura

PRA exercise at Simlapal, Bankura

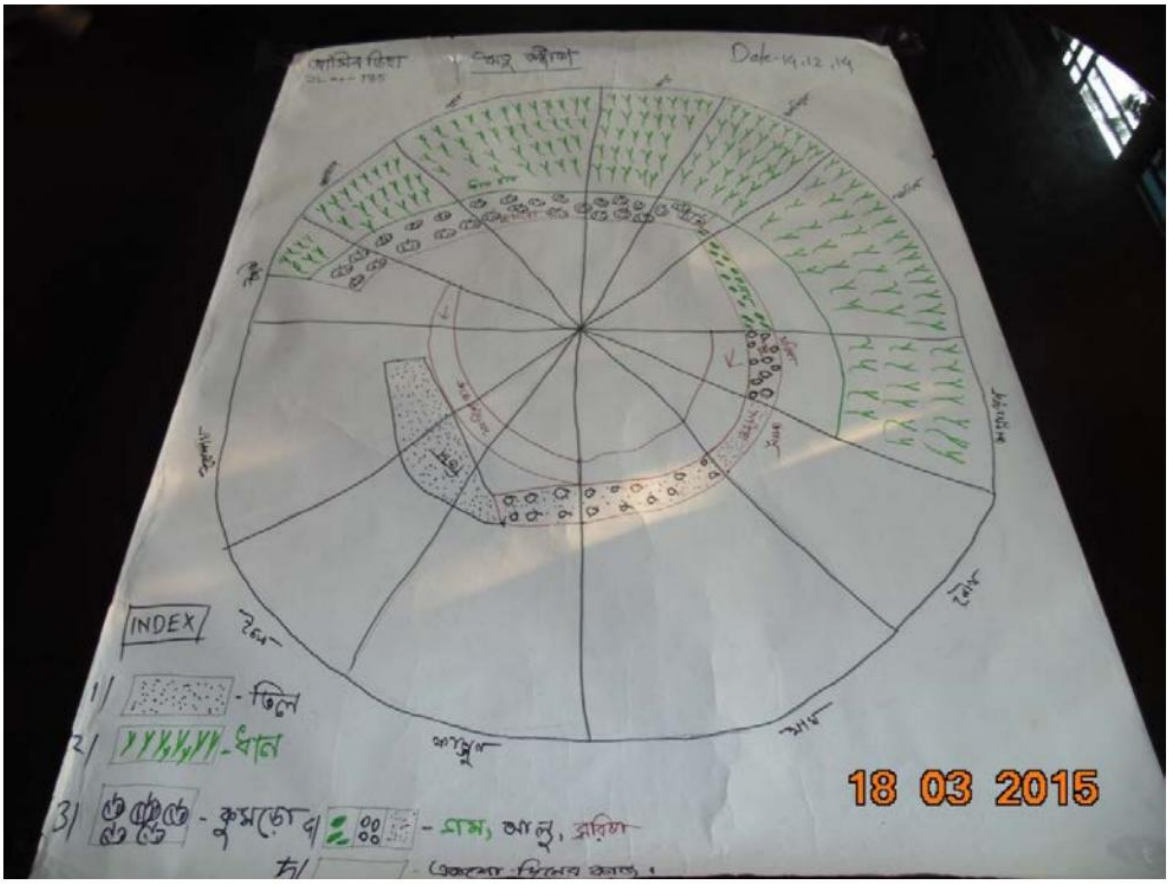


Transact Walk at Jamirdiha village

Transect walk at Natundih Village, Bundwan block, Purulia



Historical timeline prepared by JamirdihaJFMC



Seasonal Calendar prepared by the villagers of Jamirdiha

Source: West Bengal Forest Department. (2021). State Forest Report 2021. Government of West Bengal. https://www.westbengalforest.gov.in/upload/development/cm21.pdf

These image serves as a reference for the induction training of Foresters and Forest Guards under the JICA project, Capacity Development for Forest Management and Training of Personnel, implemented by the Forest Department, Government of West Bengal. It is included in their course material on Participatory Rural Appraisal.

In sum, JFM in West Bengal functions as an evolving boundary object—constantly negotiated at the intersection of state control and community agency. While it has reshaped the vocabulary of forest governance and created new institutional spaces, its transformative potential remains constrained by asymmetrical power dynamics, tokenistic inclusion, and the sidelining of

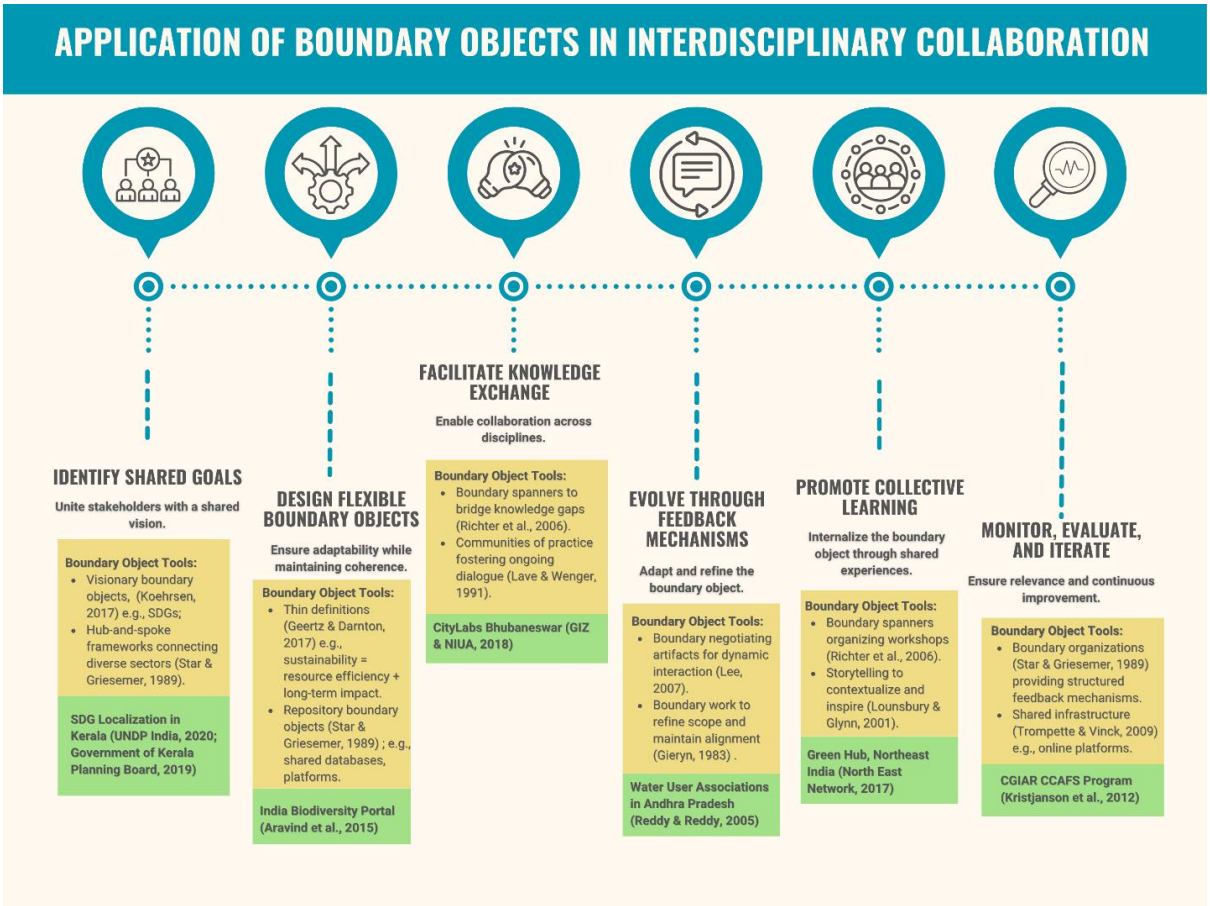
indigenous knowledge. For JFM to fulfil its promise, future iterations must transcend procedural participation and embed democratic decision-making into everyday practices. Only by centering the lived experiences and knowledge systems of forest-dependent communities can forest governance move toward true inclusivity and sustainability.

Conclusion

The examination of West Bengal's Joint Forest Management (JFM) program underscores a critical gap between the formal presence of participatory structures and their substantive functioning on the ground. Despite policy frameworks promoting decentralization, the persistence of elite control, bureaucratic dominance, gender and caste exclusion, and the marginalization of local knowledge systems reveals that participation remains largely procedural rather than transformative. This pattern reflects broader systemic limitations within India's forest governance landscape.

By applying the concept of boundary objects, this paper proposes an alternative approach—one that values difference rather than attempting to eliminate it, fostering collaboration through flexible, shared tools and practices that accommodate diverse stakeholder perspectives. Tools such as Gram Sabhas, People's Biodiversity Registers (PBRs), and social audits have achieved national recognition under legislations like the Forest Rights Act (2006), the Biological Diversity Act (2002), and MGNREGA (2005). However, their implementation is constrained by weak institutional enforcement, limited community capacity, and resistance from entrenched power structures. Other tools—such as adaptive forest plans, gender-sensitive frameworks, and NGO-mediated interventions—remain only partially adopted, often limited to donor-driven initiatives lacking legal permanence or state-wide scaling.

Meanwhile, visionary or knowledge-based tools like reimagined forests, storytelling, traditional ecological knowledge (TEK) databases beyond PBRs, and iterative stakeholder consultations continue to exist in experimental or conceptual stages, with minimal incorporation into official policy regimes. Standardizing and institutionalizing such tools is crucial not only for deepening democratic engagement but also for expanding the effectiveness of forest management across diverse socio-ecological contexts.



For these tools to serve as genuine instruments of participatory governance, their implementation must be iterative, supported by responsive feedback loops and rooted in the recognition of local communities as knowledge producers. Bridging normative policy ambitions with procedural mandates, sustained capacity-building, and institutional reforms that address entrenched asymmetries is essential. Ultimately, boundary objects hold transformative potential when embedded within inclusive governance frameworks, offering a pathway toward accountability, equity, and co-produced environmental stewardship in India's forest sector.

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