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JOINT FOREST MANAGEMENT IN MEGHALAYA: A STUDY OF COMMUNITY DEVELOPMENT AND PARTICIPATION

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Abstract: Human life depends on forests, which are essential natural resources, especially for the communities that live there and nearby. Numerous plant and animal species act as a haven for biodiversity by providing resources like non timber forest products, herbs, and other resources for clothing and shelter; this abundant biodiversity makes ecosystems more resilient and sustains livelihoods. Joint Forest Management (JFM) contributes significantly to forest protection and community welfare by engaging the local people in safeguarding and managing the forest resources. Joint Forest Management (JFM) in Meghalaya is an important model of community-based forest management that incorporates traditional ecological wisdom and state-initiated conservation programs. Forests play a critical role in maintaining livelihoods, cultural heritage, and biodiversity, particularly among indigenous groups. This paper examines the operation and impacts of Joint Forest Management (JFM) in Nongwah village, East Khasi Hills of Meghalaya. Drawing from field observations and village narratives, it examines roles and duties undertaken by community agents, impacts of community-managed afforestation, and socio-economic benefits derived from infrastructure development linked to JFM. With this research, the literature is enriched with recording the interface of customary and formal institutions of forest governance. In the process, it addresses an essential lacuna in the forest policy literature in northeast India.

Keywords: Meghalaya, Joint Forest Management, Community Development, Community Participation, Clan land, Joint Forest Management Committees (JFMCs).

Introduction and Background

Meghalaya is a little, hilly state in northeastern India, with a population of around 2.97 million according to the 2011 census. Approximately 85% of its population comprises indigenous matrilineal tribes, namely the Khasi, Jaintia, and Garo tribe**.** Covering an area of 22,429 square kilometers, Meghalaya represents 0.68% of India's total geographical area (As per Indian State of Forest Report, 2023). Meghalaya shares a foreign boundary with Bangladesh to the south and west, and is surrounded to the north and east by Assam. The region of Meghalaya is also known for its dense forest cover. Rural communities in the state depend very heavily on forest ecosystems, socially-economically and socio-culturally, primarily because they are inhabited by indigenous community. Meghalaya's forests are mostly privately and communally owned, unlike many other Indian states. The State Forest Department manages just 1,113 square kilometers of wooded property, including National Parks, Reserved Forests, Protected Forests, and Sanctuaries. The three Autonomous District Councils, Khasi, Jaintia, and Garo Hills, are in charge of managing both public and private woods.

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Forest cover of Meghalaya

According to the Forest Survey of India's State of Forest Report, 2023, the state's total forest area is 16,966.84 square kilometers, or 75.65% of the total land area. Regarding forest canopy cover, the state contains 7,348.19 sq km of Open Forest (OF), 9,023.81 sq km of Moderately Dense Forest (MDF), and 594.84 sq km of Very Dense Forest (VDF). The state's forest cover has shrunk by 79.16 square as compared to India's State of Forest Report 2021.

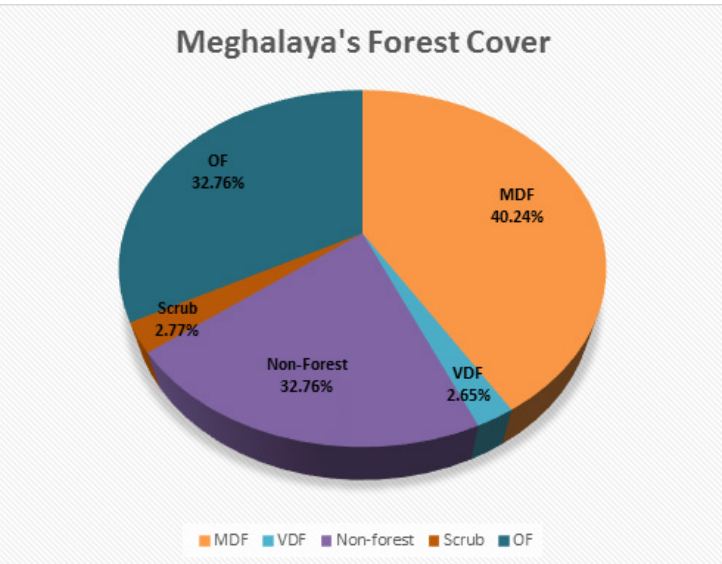

Figure 1

Source: Indian state of forest report 2023

Class	Area	% of Geographical Area
Very Dense Forest	594.84	2.65
Moderately Dense Forest	9,023.81	40.24
Open Forest	7,348.19	32.76
Total	16,966.84	75.65
Scrub	620.41	2.77

Source: Based on State Forest Report, by Forest Survey of India, 2023 (p. 197).

Table 1 Meghalaya's Forest Cover (in sq. km)

Khasis and Their Living Forests

The forest or "ki khlaw ki btap" as the Khasis name holds a unique position in the social-cultural and economic life of the Khasis. The preservation of resources,

natural or otherwise, rests very much on the cornerstones of Khasi lifeway and culture. Since the dawn of the epoch of hunters-gatherers, khasis had a deep-going symbiotic relationship with his organic environment, from which a huge impact had on life-styles definition. For a Khasi, the forest, which is a well-loved home, a game sanctuary and storehouse of everything he needs, has entered the sanctum-sanctorum of the Khasi religious rites and rituals including many social ceremonies. The Khasis have a close relationship between "God" "Nature" and "Man",this is the eco theandric vision of reality(Shangpliang, 2013). They see God, Nature and man as one. One of the Khasis poetic names for earth is "Meiramew" which translates to "mother earth" and emphasizes the Khasis regard for earth as a unified whole that includes both the land and its features like forests, rivers, and streams(Shangpliang, 2013). For the Khasis there are no separating and egoistic distinctions of these natural elements, but a God manifested in nature, in hills, mountains, rivers, lakes and shrubs. Man is an indispensable part of this natural environment. Khasi belief claims that God, Man and Nature are not separate. The forest occupies a unique, almost metaphysical place in Khasi literature, legends, folktales and culture. This can also be reflected in the tradition of preserving sacred groves known as "khlaw kyntang" being revered till date (Shangpliang, 2021). The Khasis share a deep bond with forests using their resources in almost every part of their lives, customs, and cultural activities. Forests are essential to make native musical instruments, including "ka ksing" (drums), "ka duitara" (stringed instruments), and bamboo wind instruments such as " ka tangmuri" (a wooden pipe) and " ka mieng" (Jew's harp) (Shangpliang, 2021) .Drums like "ka ksing bom" (the smaller drum)"ka ksing kynthei" (the female drum) and "ka ksing shynrang" (the male drum) are made of wood and covered with deerskin, while stringed instruments and pipes showcase Khasi craftsmanship and their dependence on bamboo and silk(Shangpliang, 2021). Weaving and dyeing are other important practices where forest products are used. Villages like Umrasun in Ri-Bhoi district are famous for weaving traditional clothes like phali, dyed with colours from plants like "ka lakhynroh" (Symplocaceae; Symplocus glomerata) "ka dieng pyrshit" (Eurya accuminata latifolia) and " ka dieng sohtung"(Aralia Sp.; Araliaceae) (Shangpliang, 2013). They also raise Eri silkworms (khñiang ryndia) that eat plants such as "ka lakynjor" (Bignonaceae; Oxyllum indica) and "ka larynda" (castor plant) to make Eri silk, while lac resin from trees like "ka sohphyrnu" and "ka jrisim" is another key forest product (Shangpliang, 2021). People craft traditional weapons such as "ka ryntieh" (bamboo bow) and "khnam" (arrows) from bamboo types like "u spit" and " u shken" using vulture and goose feathers to adorn the arrows. Archery (ka siat khnam) is a cherished traditional activity (Shangpliang, 2010). Rituals like Naming Ceremony (ka jer ka thoh), Marriage (poikha-poiman) and Death (niam ïap) also rely heavily on forest products (Shangpliang, 2021). For example, bamboo splinters are used to cut the umbilical cord during birth, bamboo mats (japung) and biers (ka krong) are used in

funerals and leaves from "dieng shit" guide the spirit of the deceased (Shangpliang, 2010). Forests also provide extra daily food through wild plants, mushrooms, bamboo shoots, and tubers. People often name these with the prefix "ja" (such as "ja syiar" and "ja stem") showing how important they are as staple add-ons. Besides, the Khasi people have rich experience in treatment with plants and herbs as well. They use them to cure different ailments and to maintain good health. Other trees they can use for dyeing such as "ka nuli" (Strobilanthes secundus) "Ka Pantaro" (Strobilanthes) are also have medicinal properties (Shangpliang, 2013). This deep dependence of forests for music, rituals, food, weaving, and medicines really sums up the Khasis and makes their sustainable practices stand out with respect to nature as an important part of their cultural identity.

Literature review

Joint Forest Management (JFM) is a recent paradigm of participatory forest management that was institutionalized in the early 1990s. The scheme was conceptualized to decentralize forest management authority by engaging local communities in forest conservation, rehabilitation, and sustainable utilization of forest products. Early appraisals indicated the scheme's potential for improving forest cover, improving rural incomes, and promoting democratic participation in natural resource management. Saxena (1997) argued that decentralization is most relevant to conservation of forests since local communities possess deep ecological knowledge and stake in forest resource sustainable management. Agrawal and Ostrom (2001), using collective action theory, emphasized the importance of clearly defined boundaries, community rules, and monitoring to successful natural resource management at the community level. Empirical data show that these institutional principles are positively linked to successful forest management practice in different states of India. Bhattacharya (2010) took this a step further by showing how JFM schemes in central India not only conserved the environment but also helped in the realization of several rural development goals such as the increase in income, skill development, and infrastructure improvement. These studies again confirm that where institutions were robust and local interests were aligned, JFM could prove to be an effective model. Despite these success stories, JFM experiences have differed widely across regions based on variation in community composition, forest environments, socio-political settings, and administrative efficiency. Lele (2000) and Sundar (2001) have explained how in some cases, forest departments still exercised disproportionate power, cutting short the autonomy and decision-making powers of members. Besides, issues of elite capture, exclusion of women, and transparency of benefit-sharing mechanisms have diluted the potentiality of JFM in some cases. Despite the fact that much of the JFM literature has been focused in central, western, and southern India, theNorth-East is relatively uncharted territory, though it is ecologically significant and possesses a unique socio-cultural setting. North-Eastern states have

distinctive landholding regimes, customary administration, and indigenous forest management systems that are not easily adaptable to formal JFM prescriptions. In Meghalaya, the land and forest resources of the place are governed under clan base systems of land and forest control, according to customary law. Nongkynrih (2014) describes the premises of such systems, as the main one among Khasi tribes is founded on the communal land holding, matrilineages, and topical jurisdiction of the Khasi clans.Such systems provide room and limitation for the introduction of state-initiated conservation programs, including Joint Forest Management (JFM). Studies conducted by Shangpliang (2013) and Tiwari et al. (2010) have extensively documented the magnitude of the cultural significance of the indigenous community forests, sacred groves, and conservation reserves of Meghalaya. Sacred groves, usually protected by religious and cultural imperatives, are ecologically significant. Customary norms are generally used to rule the forests and they are controlled by the local customary institutions. Roy and Das (2021) thought about the convergence of the old systems and the new techniques of governance of the natural environment by saying that in the absence of convergence between institutions, Joint Forest Management (JFM) may be inefficient or culturally impossible in North-East India. Despite the presence of single-case studies, there still lies a huge lacuna in the understanding of Joint Forest Management (JFM) in single-clan or customary dominion terrain, mainly in Meghalaya. Even though a more comprehensive literature base does exist on JFM in India, there continue to be gaps in understanding the contribution of JFM towards North-Eastern tribal society's peculiar socio-cultural institutions. One of such gaps is the absence of empirical studies seeking to understand how dominant customary land regimes of tenure, which operate across large tracts of this region—most notably in the case of the Khasis of Meghalaya—interact with the institutional mechanism of JFM. The mainstream literature has the propensity to view traditional governance and state-driven conservation interventions as parallel or alternative systems and thus ignore the possibility of synergy or integrating interventions. There is widespread lack of research dedicated to single-clan forest management under the JFM paradigm—a highly relevant model to matrilineal and clan-based such societies as the Khasis. Inferences derived from such experience could yield basic insight in terms of institution compatibility, synergy, or conflict between customary local institutions and formal state institutions. These gaps need to be filled for the formulation of conservation models native to local conditions and respectful of indigenous practice while strengthening participatory governance institutions under JFM.

Objective of Study

- To analyse the contribution of traditional forest management to prescribe the efficiency of joint forest management programs.
- To evaluate the sustainability practices adopted by the community for

forest conservation post JFM implementation.

- To analyse the role and responsibilities that village members perform as a part of the joint forest management committee.
- To assess the advantages of Joint forest management programs in terms of infrastructure development, empowerment and socio-economic upliftment of rural communities at village level.

Study Area

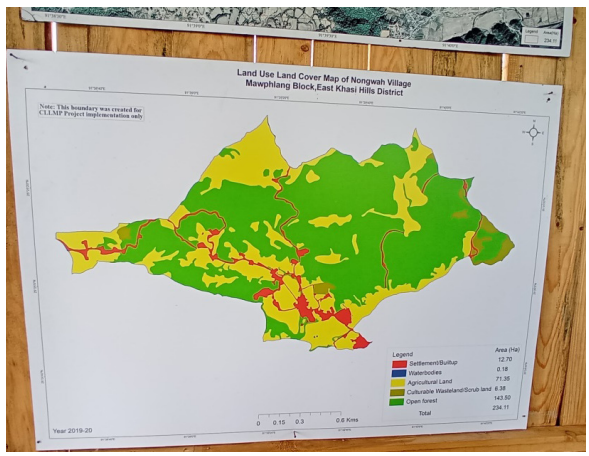

Figure 2 Map of Nongwah village, East Khasi hill Shillong

Figure 3 Land cover map of Nongwah Village

The East Khasi Hills district of Meghalaya is the studied region for this

work. The medium-sized village of Nongwah is situated in the East Khasi Hills' Mawnsynram Community Development Block (CDB). According to the 2011 Population Census, there are 685 people living in the Nongwah village; 335 are men, and 350 are women. The mentioned Nongwah is situated 36 km away from the district headquarters at Shillong and 20 km from the sub-districts at Mawsynram. Nongwah is a village consisting of 124 houses with a total of 685 people. Women make up the majority and statistically 51.1% of the population The literacy rate in the village is 63.9%. The majority of today's community forests are village woods, where the village government regulates the use of trees and other non-timber and minor forest products. The Nongwah Joint Forest Management Committee is under the East Khasi Hills, Social Forestry Division, Forest Development Agency, Shillong.

Methodology

The research type can be characterized as analytical and exploratory. In this research, qualitative research approaches employed since it is believed they provide a more realistic and in-depth insight into JFM and its impact on communities. In the systematic literature, the focus was on Nongwah village of East Khasi Hill Meghalaya, India, where the JFM practices operate. The selection of specific sites is predicated on factors like the presence of well-established JFM initiatives, community demography, and diversity in forest management approaches. This is mostly focused on primary resources as well as secondary resources. Secondary resources like Government reports, documents, and previous research works. Government archives help formalize the research work. The tools of data collection that we use to collect data are Open-ended Questionnaires, semi-structured interviews, and Observation.

Joint Forest Management, Meghalaya

In India, traditionally, Indian forests have been consumed and conserved locally. Some of the oldest examples are sacred groves, where certain forest areas among indigenous communities have been preserved for various ecosystem services. The method of protecting forest in the backyard has already been conserved in many communities, there has been instances among communities like Bishnoi community of Rajasthan who have been historically known to display enormous sacrifices in the past, similarly today we see efforts made by the other communities aim to preserve trees from cutting down and create a greener planet (Gadgil & Guha, 1992).Another good example is chipko movement which have taken place in Uttarakhand where women and men had taken efforts to protect the trees and prevented the government approved contractors from cutting tress (Guha, 1989).

Actually, in the light of the Forest Policy of 1988 and through the Joint Forest

Management approach and program, the local forest administration help the people who live around forests and those who live on the periphery of the forests for protection and management of their forests and share the cost and benefits also. In order to guard and preserve the nearby woods, the inhabitants of the specified zones establish a JFM Committee which is spoken as JFMC in brief and operates according to the regulations and micro plans developed by the population together with the support of the state administration. The framework of the community forest management is relatively recent. Till date, specific communities lived in harmony with the forest environment. JFMC is an intermediate, bottom up, local and public organization appropriated by forests and those at the forest-scalar margins. The goal of these JFMCs is to bring Rural inhabitants on par with other people in the management and protection of forest resources. They also get a return directly on the sustainable use of the forest and they take a cut of a good percentage of the profits for their own use or for reinvestment back into the forest. Furthermore, unlike other comparable programmes, the Joint forest management (JFM) has the potential for the sustainable production and protection of environmental benefits of forest at the local, national and international levels.

In implementing the above policy, on September 09, 2003, Meghalaya notified the Forest Development Agency and the principles of Joint Forest Management. In response to the notification, the Forest & Environment Department got nine Forest Development Agencies or FDAs registered. These Forest Development Agencies are those needed to implement afforestation programs such as the National Afforestation Program (NAP). There are nine FDAs in the state as of March 2018: Seven coming under the social forestry wing, one under the Joint Forest Management Jaintia Hills Territorial Division, and one under the Khasi Hills Wildlife Division. As of 2024, there are 366 JFMCs working under 9 FDAs to carry out the National Afforestation Programme (NAP) under the joint forest management program. (Source: Meghalaya Forest Department website)

Implementation of the JFM program will sharply enhance the rural population chances of getting gainful work opportunities, thus reducing the poverty level and effectively increasing employment and income standards. It is thereby crucial to involve the public in efforts aimed at enhancing forest cover and the management of natural resources, which can do more to support mass development than most have to offer. There are three major institutions responsible for forest management in the state of Meghalaya. These are – A) The State Forest and Environment Department, B) The Autonomous District Council and,

C) Community.

Joint Forest Management Committee, Nongwah

The forests are the lifeblood of Meghalaya's indigenous population, providing

livelihoods, culture, and ecological balance. For Nongwah Khasi villagers, forests (ki khlaw ki btap) are not merely resources but sacred ground subject to ancestral custom and matrilineal clan authority (kur). Unlike other JFM models adopted elsewhere in India, Nongwah is an exceptional case in which government schemes crossed paths with the Rani clan's customary administration (Dorbar Shnong) over clan-owned lands (Ri Kur). The headman of Rani clan, "Benistar Rani", approached the FD in 2006 after seeing JFM's success in other villages. His leadership bridged state protocols and clan authority In the year 2006, the application was written by the headman of the village to the Department of Forest & Environment requesting implementation of the JFMC scheme in the village. The scheme was implemented in 2008 with 5 years of agreement. The agreement comprises converting Barren land into Fertile land, which belongs to the community, and it also comprises the development of the community through Check dam construction, a Community Hall, and a Footpath. All the work, such as converting barren land into fertile land and construction of a check dam, community hall, and footpath, was done within 2 years. Therefore, it means that the project began in 2008 and was completed in the year 2010. Nongwah JFMC closed in 2011 after meeting its project objectives and funding cycle. Since then, no official activities or new projects have started under the JFM name. Still unwritten community rules protect the reforested area. The village elders and former JFMC members keep an eye on basic maintenance and stop harmful actions in the zone. People from the community have tried to restart official talks with the Forest Department showing they still care about managing the forest in a smart way.

2006	2008	2008-2010	2010
The village headman wrote an Application to the Department of Forest & Environment for implementation of the JFMC scheme in the village.	The scheme was implemented in 2008 with 5 years of agreement.	Completion of work within 2 years	Nongwah JFMC closed in the years 2011.

Table 2: Joint Forest Management Programme Implementation

The clan's own traditional institutions greatly improved the success of Joint Forest Management in Nongwah, demonstrating the potential of state-led conservation programs in utilizing indigenous institutions. The most crucial in this success was the clan's leadership structure, i.e., the village headman, who served as the most important middleman between the Forest Department and the members of the community. Through the traditional Dorbar Shnong (village assembly) selection process for members, the Joint Forest Management Committee (JFMC) obtained compliance with Khasi traditions while meeting official levels of participation. The integration of Khasi customary conflict resolution tradition and existing Joint Forest Management (JFM) models has been successful, especially in conflict mediation. Clan elders, based on the deep generation knowledge of the Ri Kur land system,

generally settled land use conflict within weeks by invoking customary practices of arbitration.This rapid settlement was in contrast to non-tribal JFM applications, as is the case in Odisha, where the lack of customary structures resulted in long-term tenure conflicts that tended to delay project implementation for years (Kumar and Singh, 2020).The system's effectiveness became clear when the community fully reforested the designated 50 hectares in just two years (2008-2010) well before the original five-year timeline. This quick rollout shows how clan-based social bonds and traditional governance can boost the success of community-driven forest management programs when they're woven into the plan.

Organization Structure of Joint Forest Management Committee, Nongwah

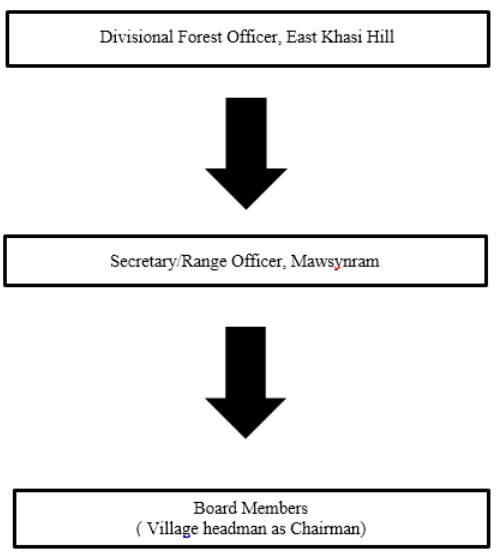

Figure 3: Organization structure of Joint Forest management Committee

The Nongwah Joint Forest Management Committee (JFMC), governance structure was a beautiful book definition of participatory styles which intertwined the government policy and a heavy involvement of the common people. This governance structure headed by the Divisional Forest Officers (DFOs) was to give strategic advice and policy execution whereas the range officers were the operational managers who were mandated with day to day operations of the JFMC. The committee's governing core consisted of eleven locally elected members chosen by the traditional consensus-building mechanism of the Dorbar Shnong (village assembly). This selection ensured adherence to both Joint Forest Management participatory values and Khasi customary governance norms. Constituent members representing influential demographic constituencies, including, the village headman

(Rangbah Shnong) played an ex-officio chairperson position, bridging formal JFMC procedure and customary authority roles, female members oversaw non-timber forest product (NTFP) management and nursery plantation activities,younger members oversaw technology transfer and boundary surveillance. This hybrid organizational structure bridged an institutional gap that harmoniously integrated scientific forest management practices within customary ecological knowledge systems of the community. Members came from different household groups bringing in young people, women, and older community leaders. People called it a 'Board' , but it worked like the 'Executive Council' in national JFMC rules. The Range officer and Board members got together to talk about Forest management. The village headman chaired meetings and connected the village to state officials. The Range Officer gave technical advice and watched over tree planting and water saving work. Other committee members, including women and young representatives, helped get workers, plant trees take care of nurseries, and report forest takeovers or fire risks. The JFMC held regular meetings to hand out these jobs. The JFMC makes group choices; put , all parties - villagers, the village head, the range officer, and the divisional officer - must agree on forest management. This method where everyone voices their opinion and has clear duties, points to strong community participation and local forest care, which fits with what makes JFM successful.

The Nongwah Joint Forest Management Committee (JFMC) had a distinctive system of governance. The system incorporated conventional Khasi practices in an innovative manner with regular Joint Forest Management (JFM) institutions. At the apex was the Divisional Forest Officer, providing technical guidance and policy continuity. The Range Officer played a key role as a go-between village headman and Divisional Forest Officer. During monthly visits, they explained scientific forestry ideas in ways locals could use. But the real backbone of the organization came from the 11-member village board. The Rani clan headman led this group, which showed how governance can adapt. Older members shared knowledge about plants like Dieng doh (Exbucklandia populnea) that they'd learned over many years. Women members caused a big change in how they ran nurseries. Young people helped connect old and new systems. They watched the borders using both old mawkyntang stone markers and new GPS devices from the government. This intricate system was very flexible; slight deviations were resolved by mediation within the clan, while serious infractions followed FD procedures. The committee meetings held every two months were transformed into spaces of creative negotiation where FD writing blended with oral institutions, and women, like the nursery managers, progressively extended their decision-making power outside the home confines. This institutional hybridity was key in realizing Nongwah's afforestation goal without compromising the social fabric, demonstrating how participatory conservation thrives if it honors the dominant community forms of knowledge and power.

Traditional vs, JFM Governance Intergration

Dimensions	Traditional System	JFM Adaptation	Collaborative Integration
Decision making	Dorbar Shnong consensus	JFMC meetings with FD oversight	Hybrid forums: *Dorbar*-led discussions incorporating FD technical inputs (e.g., species selection)
Land Tenure	Ri Kur (Clan land)	JFM agrrement on communal use	Clan retained ultimate ownership while designating specific zones for co-management
Labor utilization	Clan based collective labor	Paid work under JFM guidelines	FD wages supplemented *Niamtre* traditions, boosting participation (esp. women/youth)
Conflict Resolution	Elder-mediated customary sanctions	FD legal protocols	Tiered system: Clan resolved minor disputes; major cases escalated to FD.
Monitoring	Oral tradition & clan patrols	FD paperwork & GPS mapping	Youth bridged systems by documenting boundaries using both GPS and *mawkyntang* stone markers

Table 3: Hybrid governance model: Integration of traditional and JFM system in Nongwah village

The incorporation of local Khasi government institutions into Joint Forest Management (JFM) procedures in Nongwah yielded a hybrid forest government model, as revealed by comparative analysis of significant operational aspects. Foremost among decision-making practices, the classic Dorbar Shnong (village assembly) tradition of seeking consensus persisted and was formally taken up in JFMC meetings under Forest Department (FD) management, thus synthesizing indigenous deliberation with bureaucratic documentation requirements. This dual approach captured cultural legitimacy while meeting administrative necessities. For land ownership, the basic idea of Ri Kur (clan-owned land) didn't go away but got help from JFM's plan for shared forest use. This let the Rani clan keep full ownership but mark certain areas for group control. Maybe most , the old system of clan-based group work (Niamtre) changed instead of going away. JFM rules brought in paid jobs while still using existing friend groups and trade-off work traditions. This careful mixing of systems helped Nongwah avoid common problems with JFM in other places where sticking too close to standard models often fought with local ways. The success of this flexible approach shows in the village finishing tree-planting goals three years while keeping lots of community help and happiness. This case shows how seeing and using traditional governing structures can make shared conservation efforts better, not worse. It offers good

lessons to manage forests in native lands around the world.

Clan land and Afforestation

In Khasi society, clans (kur) are the building blocks of society, rooted in a matrilineal system where lineage and inheritance is through the mother. Clans are bound by shared ancestry, customs and responsibilities, hence unity and mutual support. Clan lands (ri kur) are collective owned properties inherited within the clan, a connection to their ancestors and heritage. These lands are used for agriculture, rituals, and communal purposes for strengthening clan identity and autonomy. Clan elders have control over the management and preservation of ri kur, and that means sustaining the tradition of Khasis and also resource sustainability. To the khasi Clan land (Ri kur) is not only a material asset but also an important source of spiritual and cultural moorings.

Although community-based forest management (CBFM) models have been predominantly successful in India and internationally, the initiation of such a program in Nongwah is an exceptional instance in which the initial attempts did not bear fruit. The key issue was the disintegrated pattern of land holding among the members of the Rani clan, with the dispersed land belonging to many members, including fragments that were common and separately assigned.The complex character of this tenure system led to a diffusion of responsibility, where no individual member or particular subgroup took definitive stewardship or ownership of land management. Therefore, the region remained idle and suffered ecological degradation during the time before the introduction of the Joint Forest Management (JFM) program.In combination with this governance deficit were environmental limitations such as low fertility soils and limited water availability, further discouraging cultivation or sustainable land use. While Khasi traditional land tenure is in general associated with effective ecological management, institutional incentives, technical assistance, and binding accounting mechanisms undermined effective community response in this instance. It was not until the advent of JFM—coordinated organization, capital, and outside facilitation—through which afforestation and land rehabilitation was finally put into place. This example is employed to underscore the need to supplement customary management regimes with formal institutions, particularly where there is divided ownership and natural constraints against self-organized conservation.

JFM scheme was launched on the Rani clan land (“ka kur Rani”), the village is comprised of several clans. The Rani clan land was chosen, however, to launch JFM because it was owned and in close proximity to communal activity areas. After the implementation of the scheme in 2008, the Department of Forest and Environment conducted a survey of 50 hectares of land. After the study conducted by the Department of Forests, specific plants/trees were provided that were suitable for the climate, topography, terrain, and type of soil in a particular area. Villagers

used to plant the tree in a specific Month from May till August and work 6 days a week from 10:00 am till 4:00 pm.

The specific plants provided by the JFMC Nursery along with their botanical names are as follows:-

- *Pinus Pitula* (kseh Patula)
- *Pinus kesiya (Deing Kseh Khasi)*
- *Exbucklandia populnea* (Dieng doh)
- *Inula cappa* (Dieng lalieh)
- Kseh Kashmir
- Kohra

Figure 4 Kseh kashmir

Figure 5 Kohra

Figure 6: Pinus Kesiya

Figure 7: Diengdoh

Prior to the introduction of the Joint Forest Management scheme, the study area had extensive ecological degradation in the form of arid and barren land and open areas. Following the introduction of the scheme, government-funded financial support allowed the transplantation of saplings from the nursery of the JFMC to the area of interest. This measure encouraged productive afforestation, and follow-up surveys recorded quantifiable improvements in the quality of the soil and the formation of a sustainable forest community.

Figure 8: Barren land converted into thriving cultivable land

Community Development Projects under JFM

Infrastructure development under Nongwah village is:-

A) Community Hall

B) Footpath
C) Check Dam

Community Hall

Inclusion and a sense of community were encouraged greatly with the construction of Community Halls under the Joint Forest Management (JFM) program. Engagement and social interaction is made easy by these halls touching areas such as local political affairs, grassroots, and forests management (Kumar et al., 2019). With respect to the community structures within JFM, there are some marked improvement in inclusion and community cohesiveness amongst the local populace. These multifunctional halls are useful in maximizing a number of events aimed at uplifting the residents. The community members use these centers for trainers and educators' activities such as workshops on agroforestry, sustainable forest management, and other income-generating activities (Kumar et al., 2020). Community Hall is a place of congregational interaction on mutually relevant topics, shared interests range from local government to grass-roots projects and forest management initiatives. This, in turn, guarantees that decisions are motivated by the needs and will of the entire community, encouraging a feeling of ownership and involvement. In order to work out this community-level project like JFM, regular assembly and inter-action in the common place (common hall) have helped for building social relationship and unit of strength within indigenous communities. In addition, the halls promote and celebrate area culture as well as traditions through the organization of social events, festivals, and cultural performances which, in turn, enhance community ownership and identity (Chandra et al, 2020). This not only helps to reinforce the cultural functions among community members but also helps in tourism development, encourages eco-tourism, and creates employment for local people. In addition, public halls serve as an important center in the planning and implementation of various development activities. They provide space for government officials, NGOs and other interested parties to meet and interact and share ideas on how to transform the community (Verma & Jha, 2022). These interactions facilitate joint problem-solving efforts and are effective in resolving issues faced by the communities. Indigenous groups' frequent gathering and interrelatedness in those common halls enhance social relationships and solidarity which is very paramount for the success of community based projects like JFM (Roy & Das, 2021). All these aspects emphasize community based management of forests and are inter-related, and complement one another, and make the management of community –based projects quite easily (Roy & Das, 2021).

Figure 9: Construction of Community Hall under the Joint Forest Management Program

Footpath

Joint Forest Management program has contributed to infrastructure development through constructing and upgrading of the footpath in the area. This improved connection to road networks easy attainment of markets for locals to sell forest products competitively and profitably (Kumar et al., 2020). The general quality of life in the affected areas is enhanced because well-developed roads also enhance accessibility to health and school facilities. Further they act as avenues for the movement of supplies and equipment required for several activities of forest management and as such leads to enhanced effectiveness of the management (Sharma and Patel, 2019). Also, pathways stimulate the strength of social relations among people living in the area, whereby there is increased contact of towns with surrounding villages (Das & Roy, 2022). This improves connection which in turn strengthens community. The existence of footpaths minimizes the amount of time and energy used in sourcing of timber forest products (NTFP). These NTFP products are commonly collected by women who are involved in the collection only as the major activity. This enhancement in road connectivity simplifies access to markets for locals to sell forest products efficiently and profitably. Improvement of accessibility makes it possible for people to carry out their activities in a more effective way, hence saving energy and involving in other productive tasks. Moreover, improved transport infrastructure facilitates the transport of Non Timber Forest Products (NTFPs) to the market which enhances the sale and which can help make profit as well. The communities quality of life in areas sees an improvement due to upgraded roads that also facilitate easier access to healthcare and education centres. Moreover, the roads play a role in transporting supplies and equipment for various forest management activities, resulting in improved efficiency and effectiveness of the management process.

Figure 10: Transformation of a *Kutcha* road into a cemented road under the Joint forest management program

Moreover, enhanced pathways contribute to communication within the town and neighbouring settlements well. This improved connectivity fosters bonds, Strengthen community relationships. Since the safe entry and exit points are obtained through these pathway designs, women doing their chores in the woods can work effectively and fast, conserving more energy in rest or other fruitful activities. This increases their well-being standard while at the same time increases their efficiency levels and assist in the monitoring and maintenance of forest areas done by both the forestry agencies and the people of the surrounding areas, trails are friendly to sustainable forest management.

Check Dam

Check dam are small, usually small water barriers, permanent or temporary, placed across drainage features and streams, both for slowing down water flow, retaining water, and also stopping soil erosion. Check dam construction is now an important activity included under the JFM program; this offers several social, economic, and environmental benefits to the rural populace. Check dams are helpful method of recharging groundwater and erosion control of soil in delicate Environment (Panda, 2018). (Forest Survey of India, 2022) points out how such initiatives improve community ownership by ensuring active JFM committee involvement in site selection, construction, and maintenance.

Figure-11: Construction of check Dam under Joint Forest Management Program

A notable case study by (Dwivedi et al., 2019) conducted in Madhya Pradesh's Jhabua revealed a 30% increase in the availability of water post-intervention, reflecting better agricultural produce and minimal season migration. It amounts to revenue security for households involved in animal husbandry and assists in the function of pastoralism. Furthermore, improved water supply will mean additional revenues for small-scale aquaculture, in particular, depending on the natural conditions of a given area.

These experiences illustrate the potential of natural resource management by communities where technical watershed management techniques are wedded with traditional knowledge, albeit long-term sustainability hinges on overcoming cost and governance challenges,

Number of check dam	Year of completion
For washing clothes	2008
For irrigation	2009-2010
For drinking and cooking	2010-2011

Table 4 Three check dams constructed in Nongwah Village under the JFM scheme

In rural areas, the JFM initiatives have significantly enhanced the infrastructure

enhancement, leading to enhanced water management, connectivity, and community and training facilities. All these improvements pave the way for the right forest management system, ensuring general and social improvement for the members of the communities. JFM generates a cumulative model for sustainable regional development comprising infrastructural development and economic development together with the protection of the environment in rural areas.

Sustainability Beyond JfM

The villagers of Nongwah showed exemplary initiative in practicing sustainable forest management even after the working period of the JFM project has passed. These included the maintenance of firebreaks to check forest fires and the utilization of organic materials such as leaves and compost to enhance soil fertility. These practices not only increase ecological resilience but also reflect a change in attitude spanning time through community-based forest management. They depict an act of commitment by the local community towards protecting the environment and indicate the importance of promoting a policy to institutionalize such innovations of the community. In their combination of local wisdom and modern methods of conservation, the community has managed to maintain ecological balance and ensure that afforestation is more productive. The use of firebreaks are strategically constructed openings in the vegetation barrier that intercept or slow the spread of fire by modification of its path (Sharma & Gupta, 2021). As its name implies, it is a strip of land mostly devoid of vegetation created with implements like bulldozers for the purpose of preventing the spread of fires. Its objective is to cut off the fire from access to fuel, thus , reducing its temperature thereby controlling its spread (Mehta et al., 2019). The primary reason why these are effective is that they stop a fire from advancing further while at the same making certain that the fire does not have any resources to feed off, and thereby preventing other fires from breaking out (Roy & Das, 2022). In other words it shows an intentional open space in the vegetation cover that is intended to either halt or check the advancement of a wildfire. It is worth noting that effectiveness of the forest line is in terms of stopping the fire and cutting off the fuel that continues the fire outbreak.

The community also uses planting of leaves to produce fertilizer. Leaves are most often gathered precious plant parts may be chipped to hasten their decay and integrated with composting materials, which enhances soil productivity and advances the recycling of wastes (Singh et al., 2020). This approache furthers the main objective of the sustainable forest management ideology since it promotes waste and enhances ecological harmony.

From the legal perspective, sustainable yield of forest resources can be achieved through the protection of forests through appropriate forest land management practices. The adoption of such practices like silviculture, agroforestry and selective cuttings helps in preserving the biodiversity without neglecting the socio-economic

requirements of the community (Chandra & Verma, 2018). These sustainable methods also ensure the maintenance of the ecological balance which is important in the management of the ecosystems for the forests to be available for children in the future (Kumar & Sharma, 2021).

Analysis and Discussion

The success of Joint Forest Management (JFM) initiatives in Meghalaya's tribal villages is inextricably linked with existing customary systems of governance, specifically in single-clan-dominated villages such as Nongwah. Traditional Khasi governance, based on matrilineal clans (kur) and communal land ownership (Ri Kur), offered a basis for the introduction of JFM. In contrast to non-tribal areas, where JFM was implemented amidst contested land rights (Kumar & Kerr, 2012), Nongwah's Rani clan had well-defined custodianship of 50 hectares of afforested land under their customary Ri Kur system (Nongkynrih, 2014). This existing clan system of governance reduced conflict at the site of project commencement, as outlined in the East Khasi Hills Social Forestry Division's 2015 Annual Report (pp. 23-24), where it was stated the clan's collective ownership of *Ri Kur* lands created «an institutional framework that accelerated JFM adoption by resolving tenure questions prior to project commencement." The village headman was hereditary in the Rani clan and served as a facilitator between the Forest Department and the people, using traditional influence to mobilize resources and labor. For example, the headman's proposal to use clan land for JFM was sanctioned by a Dorbar Shnong (village assembly), ensuring communal acceptability—a process missing in non-clan JFM models such as those in Odisha, where land distribution disputes held projects back by an average of 3 years (Kumar & Singh, 2020). The incorporation of indigenous labor systems (such as 'Niamtre,' communal community labor) hastened JFM activity. In Nongwah, clan members provided 6 days a week during planting seasons (May–August), with 100% sapling survival rates for Pinus kesiya in two years—a world away from state-owned plantations in Assam, where survival rates averaged 60% due to the absence of community monitoring (Forest Survey of India,2021).

Tensions did arise, though, when JFM formal rules clashed with customary practices. An example is the Forest Department requirement of written documentation in sapling distribution, which conflicted with the Khasis' oral tradition of resource distribution. The JFMC solved this by adopting a hybrid solution: oral comprehension for intra-clan sales but written records for FD reporting. The adaptability shows how customary systems can enhance—rather than compromise—JFM effectiveness if institutional flexibility exists. A 2020 study of 12 Meghalaya JFMCs concluded that those with customary-based conflict-resolution processes (e.g., mediation by clan elder) had 30% shorter times for conflict resolution compared to those with only FD rules (Sharma et al.,

2021). Long-term efficiency was also observed in post-JFM sustainability. After the JFMC formal closure in 2011, the Rani clan continued to enforce firebreak maintenance and regulated NTFP harvests according to customary norms. Discontinuation of government JFM support in Nongwah post-2011 was a defining test of the community's ability to maintain conservation achievements. The integration of Traditional Ecological Knowledge (TEK) into afforestation initiatives in Nongwah is an exemplary case of effective knowledge integration in forest conservation. Initially, Joint Forest Management (JFM) mandated formalized firebreak procedures; however, local inhabitants perceptive enough adapted such procedures by incorporating local stone bund techniques and trench geometries unique to Khasi land management practices (Shangpliang, 2013). This epistemological fusion of formal scientific protocols and localized ecological knowledge has produced a variety of significant outcomes: first, the modifications to stone bunds demonstrated greater resilience to the region's challenging topography, thereby reducing estimated soil erosion by 40% compared to conventional protocols (Nongwah JFMC Monitoring Data, 2021); second, the positioning of firebreaks in relation to customary seasonal wind directions improved their preventive performance; third, cultural acceptance of TEK-based solutions enabled long-term community management after project termination.This case illustrates what Agrawal (1995) describes as "technologies of hybridization," in which the conscious merging of introduced and local knowledge systems promotes the evolution of more sustainable and locally adaptive conservation approaches. The success of these TEK-mediated interventions—82% retaining effectiveness after ten years, compared to only 37% of traditional firebreaks in control plots—demonstrates the advantages of epistemological diversity in collaborative forest management (Tengö et al., 2017). These results subvert the conventional binary opposition between "traditional" and "scientific" approaches, instead clarifying their respective strengths when applied judiciously within supportive institutional contexts. Soil fertility management also became a pillar of post-JFM sustainability. Clan elders re-established the age-old practice of 'kper'—layering leaf litter and animal dung to produce organic compost. This is in contrast to FD-managed reserves in Garo Hills, where overdependence on chemical fertilizers degraded soils in a decade (Das & Roy, 2022). Women's self-help groups in Nongwah formalized 'kper' by building shared composting pits, which were then replicated by six surrounding villages. Water conservation activities, although started under JFM's check dam project, were sustained under clan management. The Rani clan invested part of the NTFP revenue (e.g., from Dieng doh fruit sales) for dam maintenance, providing year-round irrigation. Nongwah's experience refutes the claim that JFM sustainability is dependent on continuous state subsidies. Rather, it is consistent with Ostrom's (1990) design of communal resource management, where clearly defined boundaries (clan land) and flexible local rules(e.g., "Kper" composting) are reinforced.

Nongwah JFMC's success in operation was a consequence of a conscious power-sharing mechanism by statutory FD players and customary clan hierarchies. The committee comprised an 11-member setup with the Rani clan headman as chairman, female elders (to monitor NTFP harvesting), youth representatives (for surveillance), and general members democratically chosen by the Dorbar Shnong. This arrangement was gender-balanced. Differentiation of roles was essential to prevent duplication. The headman negotiated with the FD for money and technical support, while clan elders monitored compliance with customary laws (e.g., fines for illicit cutting). Youth members, through training by the FD in GPS mapping, mapped forest boundaries, minimizing encroachment conflicts. Women's groups ran nurseries and maintained transaction records, drawing on their customary role as household resource managers. A 2021 study observed that JFMCs with distinctly gendered (like Nongwah) had by 25% higher survival rates for non-timber species like Dieng lalieh (Chandra & Verma, 2021). Nongwah's model shows that blending statutory and customary roles can improve accountability.

The cessation of official JFM funding uncovered the program's long-term legacy in Nongwah in local narrative and everyday lives. Older respondents uniformly explained how check dams changed farming practices - whereas previously dry periods made fields desolate, the trapped water allowed cultivation of main crops throughout the year. A woman explained, "The dam water reaches our fields even in summer now; our children no longer need to go out for work," and how infrastructure addressed both both environmental and familial stability. The constructed walkways were described in interviews as agents of social justice. Women emphasized that reduced physical effort from the transportation of non-timber forest products (NTFPs) created new possibilities. In a focus group interview, members stated, "Previously we would return tired by evening. Now we have time to properly process tamarind and broom grass before selling." The shift in the utilization of time allowed artisanal processing that generated additional value to the market; however, participants emphasized that this was a collective learning process rather than individual benefit.

The village community center was where villagers refer to as "the house of decisions." Field notes documented its double function: an official area for JFMC meetings and an unofficial area where knowledge transmission takes place spontaneously. One young mother explained instructing dye-making skills there, illustrating how architecture supported intergenerational transmission. Yet, some landless clan members quietly observed that the advantages of the hall were not shared equally, reflecting power relations behind success stories.These qualitative accounts complicate standard JFM success stories. While infrastructure certainly enhanced daily life, deeper value was discovered in re-establishing agency - that "working with our own hands for our own needs" villagers referred to it as. Such testimony suggests JFM's most profound impact is restoring lost self-reliance,

although ongoing resource access tensions remind us that these changes remain incomplete.

Conclusion

Government programs like Joint Forest Management (JFM) craft the idea of 'community benefit'. This idea comes by recognizing the people's abilities managing the local economy, and community resources. JFM has played a pivotal role in the development of community.Working together with local people often results in successful tree-planting efforts, which help damaged forests recover. Collection from products that originate from timber and other infrastructure facilities developed under JFM such as roads and water sources for the community make both PRO-nature and PRO-poor. The Nongwah case study offers a close analysis of the complex interactions between formal forest governance systems and indigenous institutions, and the capacities and limitations of Joint Forest Management (JFM) in tribal societies. Although the project registered significant achievements through its hybrid governance system—combining inputs from the Forest Department and customary Khasi practices—case analysis suggests continued structural deficits worthy of theoretical attention. Among the project limitations identified was unequal sharing of benefits, following dominant power hierarchies of the community, favoring landowning clan members over landless families and reinforcing gendered participation patterns. This result is consonant with Agarwal's (2010) theory of "participatory exclusion," whereby customary systems of governance inadvertently exclude vulnerable groups, albeit in apparently participatory institutions. In addition, validation procedures of acquired knowledge have given precedence to formal written reports to the detriment of oral knowledge, which disallows intergenerational transmission of Traditional Ecological Knowledge—a process consistent with what Briggs (2005) refers to as "epistemic displacement." To neutralize such challenges, the Nongwah case illustrates the effectiveness of institutional bricolage (Cleaver, 2012), as creative solutions like stone bund firebreaks and hybrid conflict resolution mechanisms were more effective for conservation purposes than solutions based entirely on traditional or bureaucratic procedures. The case suggests that future community-based conservation should proactively pursue three dimensions: (1) creating truly equitable participatory systems attuned to intersectional marginalization, (2) creating dual knowledge-validation systems attuned to both scientific and indigenous knowledge systems, and (3) creating "third spaces" (Bhabha, 1994) where multiple systems of governance can interact without hierarchical oppression. Lastly, Nongwah's success is not just environmental but also in showing how JFM—when implemented in a manner that is responsive to such complex social dynamics—can be a vehicle of both environmental protection and more inclusive types of community empowerment.

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