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Sacred Groves, Megaliths and Ritual: Belief-Based Biodiversity Conservation and Traditional Resource Management Among the Pnar of Nartiang, West Jaintia Hills, Meghalaya, India

Anamika Upadhaya¹, Shikhar Kumar², Lovely Raliang³, Meghali Baruah⁴

^{1, 2, 3}Department of Environmental Studies, North-Eastern Hill University, Umshing, Shillong 793022, Meghalaya, India

⁴Department of Geology, North-Eastern Hill University, Umshing, Shillong 793022, Meghalaya, India

Abstract: *Among many indigenous societies, religious belief and customary institutions function as an informal but effective system of biodiversity conservation and natural-resource management. This study examines that system in Nartiang, a large Pnar (Jaintia) village in West Jaintia Hills district, Meghalaya, that is distinctive for retaining a living traditional religion (Niamtre) alongside one of the most important megalithic landscapes in India. Data were collected through household and field surveys, semi-structured interviews with village elders, the traditional chief (Daloi) and three folk medicinal practitioners, and direct documentation of plants, rituals and agricultural practice. The sacred landscape of the Iaw Mulong monolith garden and a network of belief-protected sacred groves (kloo blai) are shown to underpin the local conservation ethic. The Niamtre ritual calendar is closely articulated with the agricultural cycle through a sequence of kñia rites, and the farming calendar is further guided by phenological indicators—the leafing of *Quercus serrata*, flowering of *Schima wallichii* and fruiting of *Castanopsis indica*. Traditional agriculture conserves rice landraces and integrates crop–livestock production, while eighteen wild-edible and non-timber forest species and seventeen ethnomedicinal plants document a substantial body of plant knowledge. The paper argues that the intertwining of the sacred and the ecological has conserved biodiversity at Nartiang, and that pressures of population growth, expanding shifting cultivation and generational attrition now threaten this system, making documentation and community-based safeguarding urgent.*

Keywords: *Traditional knowledge; sacred groves; megaliths; Niamtre; ethnobotany; phenological indicators; Pnar; Jaintia; Meghalaya.*

I. INTRODUCTION

All human societies interact with, and to some degree manage, the ecosystems around them, and the skills and institutions through which indigenous and local communities do so offer valuable models for biodiversity policy (Lertzman 2009). Traditional or indigenous knowledge—the cumulative, orally transmitted body of practice and belief that evolves through the long relationship between a people and its territory (Berkes 2012)—closely interlinks cultural and biological diversity and forms an essential basis for the conservation and sustainable use of biodiversity. Increasingly, this knowledge is recognised not merely as heritage but as a working system of adaptive management (Berkes et al. 2000).

North-East India, within the Indo-Burma biodiversity hotspot, is home to numerous tribal communities whose customary institutions have long governed the use of forests, water and land. In Meghalaya, the Khasi and Jaintia peoples maintain a well-documented tradition of belief-based natural-resource conservation, of which the sacred grove is the best-known expression: patches of forest set aside under religious sanction and traditional land tenure, known variously as law kyntang, law lyngdoh and khlaw blai (Gurdon 1975; Tiwari et al. 1998; Jeeva et al. 2006). These groves conserve significant biodiversity, and the rites performed within them bind conservation to cosmology (Gadgil & Vartak 1975; Khan et al. 1997).

The Jaintia, who call themselves the Pnar, are concentrated in the eastern hills of Meghalaya and were historically organised under chiefs (Daloi) within the kingdom popularly remembered as the realm of the twelve chieftains. A substantial section still follows the indigenous religion, Niamtre, and celebrates an agricultural ritual calendar. Nartiang village is exceptional in this respect: it retains an almost wholly Niamtre population and, at its heart, the largest concentration of megalithic monuments in Meghalaya, giving it an unusually intact articulation of sacred landscape, living religion and traditional livelihood. Yet detailed village-level documentation that treats these elements as a single knowledge system remains scarce.

The present study was undertaken to (i) survey and document the history and cultural profile of Nartiang village; (ii) record its belief-based institutions of resource management—sacred landscape, sacred groves and the ritual calendar; (iii) document associated agricultural, ethnobotanical and ethnomedicinal knowledge; and (iv) assess the pressures on this system and recommend measures for its conservation.

II. STUDY AREA AND METHODS

A. Study Area

Nartiang lies in the Thadlaskein block of West Jaintia Hills district, Meghalaya, about 12 km from the district town of Jowai and some 63 km from Shillong. Set among terraced paddy fields and encircled by the perennial Myntang river, it is a large village of 774 households and a population of about 4,149 (2022 village census), organised into seven localities—Lum Majar, Lum Kyalindoh, Lum Bisary, Wah Lusut, Wah Shlem, Khlieh Shlem and Poh Iaw. The people are Pnar (Jaintia) and are overwhelmingly adherents of the Niamtre religion. Local tradition derives the village name from nar (iron) and the tiang–tiang sound of former ironworking, recalling an economy once based on abundant iron ore.

Governance retains the traditional office of the Daloi, an elected chief drawn at Nartiang from three eligible clans (Dhar, Lamare and Dkhar), who exercises administrative, judicial and ritual functions within his elaka. Livelihoods are mixed: most households cultivate rice and vegetables on small farms, and stone and sand quarrying, non-timber forest product collection, animal rearing, handicraft, wage labour and salaried service supplement farm income. The village is best known for the Iaw Mulong “garden of monoliths” and for the Nartiang Durga temple, traditionally held to be one of the fifty-one Shakti Peethas.

B. Methods

Primary data were gathered through field and house-to-house surveys using a semi-structured questionnaire covering the way of living, religious practice, socio-economy, agriculture and the harvesting of non-timber forest products, medicinal plants and wild edibles. Key informants included village elders, the Daloi, ritual functionaries and three traditional healers (nong-ai-dawai). Plants used for food, medicine and ritual were collected and photographed during field visits, with local (Pnar) names, plant parts used and applications recorded. Botanical identities were assigned from morphology, common names and the regional ethnobotanical literature; where a recorded binomial denotes a species whose native range lies outside the region, the identification is treated as provisional (marked “cf.”) pending herbarium verification. Documented material was organised around the theme of belief-based resource management for description and discussion.

III. RESULTS AND DISCUSSION

A. The sacred landscape: the Iaw Mulong monoliths

At the centre of Nartiang stands the Iaw Mulong stone garden, the largest concentration of megaliths in Meghalaya and long a focus of traditional religious rites (pam-blanc-law) periodically performed by the Daloi. The upright menhirs are known as ki moo shynrang (“male” stones) and the flat table-stones as ki moo kynthai (“female” stones); the tallest, Moo Long Syiem, stands about eight metres high and is attributed to U Mar Phalyngki, a lieutenant of the Jaintia kings, with other stones raised by U Luh Lyngshkor Lamare and various clans. The origin narrative recorded in the village—of a king who, refused a bamboo umbrella (knup), lifted a market slab to shelter from the rain and set it down at Nartiang, thereby shifting the market from Raliang—ties the monoliths to the founding of the settlement itself.

The monoliths function as a sacred landscape that anchors clan identity and ancestral memory, and their continued upkeep by the community exemplifies how heritage and belief sustain a protected space at the heart of the village. It should be noted that while local tradition and much popular writing link the megaliths to mortuary practice, the funerary role of the dolmens specifically has been questioned on archaeological grounds; the account given here is therefore presented as the community's own understanding rather than as settled archaeology. The adjacent Durga temple, fashioned in the form of a Khasi–Jaintia house with a central wooden pillar, marks the historical adoption of Hindu practice by the Jaintia royal line and the syncretism discussed in 3.3.

B. Sacred groves and belief-based forest protection

Complementing the monolith garden is a network of sacred groves—small patches of ancient forest dedicated to local deities and known at Nartiang as klool blai—in which ancestral worship is performed and from which the collection of fruit, flower, leaf or wood is prohibited for fear of offending the sylvan deities. Several such sites, each associated with a particular deity or rite, were recorded (Table 1). Because access is regulated by belief rather than by statute, these groves have remained relatively undisturbed

“since time immemorial,” and they function locally as reservoirs of native biodiversity in exactly the manner documented for sacred groves across Meghalaya and India more widely (Gadgil & Vartak 1975; Tiwari et al. 1998; Jeeva et al. 2006). Their persistence at Nartiang illustrates the central argument of this paper: that religious sanction has operated as an effective, low-cost mechanism of in-situ conservation.

Sl.	Sacred site	Associated deity / rite
1	Um-tisong	Blai Umtisong
2	Poh-iaw	Pam Blai Iaw
3	Phlong	Kñia Khlam
4	Lum-bah-long	Ryngkaw
5	Lum-kya	Ryngkaw
6	Um-lakhit	Kñia Pator

Table 1. Sacred sites of Nartiang and their associated deities or rites.

C. Niamtre and the ritual–agricultural calendar

The indigenous religion Niamtre (from niam, religion, and tre, origin) is held to have been given by God at the beginning of time. Its cosmology centres on a supreme male god, U Blai Kynrad, served by numerous subordinate deities with specialised functions—among them Ka Syiem Synshar (creation and sustenance of humankind), U Bihsakurom (protection from sickness, disease and war), Blai Shnong Blai Thaw (guardian of production, trade and agriculture) and Blai lung Blai Sem (protector of household and clan). Worship proceeds largely through animal sacrifice—cock, pigeon, goat or pig—offered conditionally in expectation of, or thanksgiving for, divine favour, using ritual materials that include red rice, betel nut, banana and packing leaves and a set of ritually significant plants (Table 2).

Strikingly, the ritual cycle is synchronised with the farming year through a sequence of kñia (“sacrifice”) rites performed by the Lyngdoh. Kñia Khang, in April, is intended to keep sickness from the village before cultivation begins; Kñia Blai Lyngdoh, the most important rite, is held once a year before planting; Kñia Khlam drives away epidemic disease after sowing in July; Kñia Umtisong and Kñia Blai Kupli precede seed-sowing to secure a fruitful, pest-free crop; Kñia Pyrthad seeks protection from thunderstorm, flood and hail; and Kñia Pyrdong guards against disease through the year. This tight coupling of ritual and agronomy shows how Niamtre encodes an agro-ecological calendar within religious practice.

Alongside the indigenous rites, Nartiang hosts a distinctive tribal–Hindu syncretism. Three pujas—Duitra (a spring colour festival), Bisari (celebrated in August for protection from snakebite) and, above all, Durga puja—are observed. During Durga puja, held in late September or early October, a banana plant is robed in white cloth, decked with marigold and worshipped as the goddess before ceremonial immersion in the Myntang river; buck goats and pigeons are sacrificed, with four goats mandatory from the Daloi. Tradition recounts that the Jaintia king, unfamiliar with the puja, invited Deshmukh Brahmins from Maharashtra to officiate—an origin story that neatly captures the fusion of Niamtre and Hindu practice around the Shakti Peetha at Nartiang.

Local name	Common name	Botanical identity (family)
Sla lamet	Packing leaf	<i>Phrynium pubinerve</i> (Marantaceae)
Sning / kynditsla	Chestnut twig	<i>cf. Castanopsis</i> sp. (Fagaceae)
Sla ladaw	Banana leaf	<i>Musa acuminata</i> (Musaceae)
Pathi	Betel leaf	<i>Piper betle</i> (Piperaceae)

Table 2. Plants used in Niamtre rituals at Nartiang.

D. Reading the landscape: phenological indicators of the farming calendar

Beyond the ritual calendar, Nartiang farmers read the biological landscape itself to time agricultural operations, using the phenology of particular plants and the behaviour of insects as ecological indicators (Table 3). The spring leaf-flush of the Jolcham oak (*Quercus serrata*, locally ra-ting) signals the pre-sowing season and the time to ready implements and seed; the flowering (phuhsyntu) of needle-wood (*Schima wallichii*, shyrrngan) marks the moment to transplant rice seedlings to the wet paddy; and the fruiting of chestnut (*Castanopsis indica*, dien-sning) indicates that the paddy is ready for harvest.

At a finer scale, the evening calling of a cicada (iang-salia) and a katydid (charait), and the late-afternoon folding of goosegrass culms (cf. *Eleusine indica*, burli), tell workers when to end the day's labour. Such bio-indicators constitute a locally calibrated, observational phenological calendar—a form of traditional ecological knowledge that complements, and is more finely tuned than, the fixed ritual dates.

Indicator (family)	Local name	Signal for the farmer
<i>Quercus serrata</i> (Fagaceae)	Ra-ting	Leaf-flush → onset of spring; prepare for pre-sowing
<i>Schima wallichii</i> (Theaceae)	Shyrngan	Flowering → transplant rice seedlings
<i>Castanopsis indica</i> (Fagaceae)	Dien-sning	Fruiting → rice harvest ready
Cicada & katydid (insects)	Iang-salia; charait	Evening call → end of the working day
cf. <i>Eleusine indica</i> (Poaceae)	Burli	Late-afternoon folding of culms → time to cease work

Table 3. Phenological and behavioural indicators used to time agricultural work at Nartiang.

E. Traditional agriculture and agrobiodiversity

Agriculture is the mainstay of Nartiang, with rice (*Oryza sativa*) the chief crop, supplemented by ginger, maize, potato, beans, tomato and other vegetables. Two systems predominate—rainfed lowland rice and shifting cultivation (jhum)—both adapted to local conditions and understood by farmers in terms of the ecological balance they maintain (Laloo et al. 2006; Ramakrishnan 1992). The kharif crop is sown in June–July and harvested in November. Land is prepared by ploughing and harrowing, and seedlings are raised in wet or dry nurseries, the wet nursery being preferred for its greater fertility; rice is established either by transplanting (higher-yielding but labour-intensive) or by broadcasting. Upland rice, grown on dry soil and dependent wholly on rainfall, yields less than the rainfed lowland crop.

The system conserves agrobiodiversity in the form of named rice landraces (Table 4), maintained through farmer seed selection and traditional storage in woven bamboo containers (thiar) within a covered wooden granary (myndar) that keeps the seed warm and dry. Ginger, the principal cash crop, is grown as a rainfed crop on shifting plots, the land being rotated annually because continuous cropping depresses yield—an indigenous soil-fertility strategy. Livestock (cattle, pigs, goats and poultry) are integrated with cropping in a mixed crop–livestock system in which dung serves as fuel, manure and plastering material and animals provide draught power and a store of wealth mobilised for ritual, marriage, medical and educational needs.

Landrace	Grain type	Notes
Kho Soo	Reddish	Pigmented (red) grain
Pnah lieh	White	lieh = “white” in dialect
Pnah iong	Black / purple	iong = “black” in dialect; pigmented grain
Kho nipur	White	White-grained landrace

Table 4. Traditional rice landraces maintained at Nartiang.

F. Wild-edible plants, non-timber forest products and ethnomedicine

Plant-based knowledge remains a substantial component of the local resource system. Eighteen wild-edible and non-timber forest resources were recorded, gathered seasonally as food, medicine and fodder and, in several cases, sold for small cash returns (Table 5). Most are leafy vegetables and wild fruits—pennywort (*Centella asiatica*), fish mint (*Houttuynia cordata*), water celery (*Oenanthe javanica*), taro (*Colocasia esculenta*) and Indian gooseberry (*Phyllanthus emblica*) among them—together with a few animal-derived items such as wild honey, paddy-field snakehead fish and an edible moth, reflecting a broad gathering economy consistent with wider surveys of the Khasi and Jaintia hills (Kayang 2007; Sawian et al. 2007; Phawa et al. 2019). Several field names that carried non-native binomials in the source data are given here provisionally pending voucher confirmation.

Seventeen ethnomedicinal plants used by the village healers were documented (Table 6). Knowledge is transmitted orally between generations, and the recorded uses cluster around everyday complaints: digestive disorders (guava and pomegranate leaf pastes for diarrhoea and dysentery; prickly-ash and crofton weed for stomach ache), respiratory conditions (black pepper and ginger with honey for cough and sore throat), wounds and burns (betel and plantain pastes; raw potato), snakebite (chickweed and pink sorrel), and urinary and renal complaints (pennywort paste; fishbone-fern rhizome for kidney stone). Culturally important spice-medicines such as turmeric—applied with ginger and mustard oil to set fractures—anchor the pharmacopoeia. These records accord with the documented ethnomedicine of the Jaintia and neighbouring communities (Barik et al. 2009; Jaiswal 2010) and, as ethnographic observations, provide leads for phytochemical study rather than validated therapies.

Sl.	Botanical identity	Family	Local name	Use
1	<i>Centella asiatica</i>	Apiaceae	Latyngkheit	Salad
2	<i>Curcuma aromatica</i>	Zingiberaceae	Lachein	Rhizome boiled with onion, chilli, sesame
3	<i>Houttuynia cordata</i>	Saururaceae	Jamyrdoh	Raw; chutney; salad
4	<i>Myrica esculenta</i>	Myricaceae	Sylia	Fruit edible
5	<i>Crassocephalum crepidioides</i>	Asteraceae	Iada	Cooked; fodder
6	<i>cf. Sagittaria</i> sp.	Alismataceae	Kuchri	Salad
7	<i>Oenanthe javanica</i>	Apiaceae	Cha-wing-blai	Salad
8	<i>Rhus javanica</i>	Anacardiaceae	Sa-ma	Young leaves as salad
9	<i>cf. Sonchus</i> sp.	Asteraceae	Ia-jer	Salad
10	<i>cf. Begonia</i> sp.	Begoniaceae	Jakyrdup	Salad
11	<i>Rubus ellipticus</i>	Rosaceae	Sohchieh	Fruit edible
12	<i>Bidens pilosa</i>	Asteraceae	Sabarthit	Young leaves cooked
13	<i>Colocasia esculenta</i>	Araceae	Wang	Leaf, stem, rhizome (cooked)
14	<i>cf. Castanopsis</i> sp.	Fagaceae	Syut	Nuts edible
15	<i>Apis mellifera</i>	Apidae	Ngap	Wild honey
16	<i>Channa</i> sp.	Channidae	Dohthli	Paddy-field fish
17	<i>Kunugia latipennis</i>	Lasiocampidae	Ngiangkseh	Edible moth
18	<i>Phyllanthus emblica</i>	Phyllanthaceae	Samyrlain	Fruit edible

Table 5. Wild-edible plants and non-timber forest products of Nartiang (a few animal-derived items included). “cf.” denotes a provisional identification requiring voucher confirmation.

Sl.	Botanical identity	Family	Local name	Part used / ailment
1	Curcuma longa	Zingiberaceae	Chyrmit	Rhizome paste (with ginger, mustard oil) to set fractures; skin
2	Piper nigrum	Piperaceae	Murit	Dried-seed powder with honey for cough, dry throat
3	Zingiber officinale	Zingiberaceae	Sying	Rhizome paste with water and honey for cough, sore throat
4	Psidium guajava	Myrtaceae	Sla sohpriam	Leaf paste for diarrhoea, dysentery
5	Punica granatum	Lythraceae	Sla snilen	Leaf paste for diarrhoea, dysentery
6	Piper betle	Piperaceae	Pathi	Leaf paste on minor cuts and wounds
7	cf. Zanthoxylum armatum	Rutaceae	Ja-iur	Fruit and leaves for stomach disorder
8	Myrica esculenta	Myricaceae	Sohphai	Juice for fever and stomach disorder
9	Nephrolepis cordifolia	Nephrolepidaceae	Tyrkhang	Rhizome for cough and kidney stone
10	Solanum tuberosum	Solanaceae	Salah	Slice/paste for minor burns
11	Plantago major	Plantaginaceae	Ckhor blang	Whole-plant paste on cuts and wounds
12	Hydrocotyle sibthorpioides	Araliaceae	Plang suhyandong	Paste (with water) for urinary retention
13	Phalaris arundinacea	Poaceae	Khloiang mi	Paste for pruritus
14	Drymaria cordata	Caryophyllaceae	Sla mainul	For snakebite
15	Oxalis latifolia	Oxalidaceae	Jatkhu	For snakebite
16	Acmella caulirhiza	Asteraceae	Chyrmit-blai	For toothache
17	Ageratina adenophora	Asteraceae	Khlo-sma	Minor cuts; stomach ache

Table 6. Ethnomedicinal plants recorded from traditional healers of Nartiang. Botanical names have been standardised; “cf.” denotes a provisional identification.

G. Foodways, fermentation and mortuary tradition

Rice is elaborated into a range of traditional snacks (tpu) prepared by steaming, boiling and frying pounded rice with jaggery—among them tpu-phniang, tpu-langdong, tpu-sla and tpu-señ (cooked on a special earthen disc, wien)—with additional festival varieties such as tpu-skер, tpu-mynkruit and ladu made only during Durga puja. A local rice liquor, kiad, accompanies almost every festival and ceremony and is a significant source of income; its preparation, involving a natural yeast (thiat), fermentation of cooked rice for two to three days and distillation in a specialised apparatus, follows the process documented for the Pnar by Samati and Begum (2007), with the residue (yan-dem) fed to livestock.

Mortuary tradition connects the living to the megalithic landscape. After cremation, a fragment of bone is placed in a hollow cut in a tree trunk or beside a large stone near the cremation ground, then—wrapped in white cloth with mustard oil, betel nut and betel leaf—transferred by the male head of the family to the clan ossuary-dolmen (in the kpep), where an earthen pot (khiew lrynai) receives the bones of the clan's dead so that, in Jaintia belief, all the deceased of a clan are reunited. Informants reported that this transference has largely ceased: the accompanying hymns are no longer remembered, and many now leave the bones in the tree or by the stone. The lapse of this rite is a telling marker of the wider erosion discussed below.

H. Change, erosion and safeguarding

Despite the resilience of belief-based institutions at Nartiang, the study finds the knowledge system under mounting pressure. Population growth has driven extensive forest clearance and an expansion of shifting cultivation, degrading habitat and, with it, the medicinal and edible plant base and the knowledge attached to it. The concentration of healing knowledge in three ageing practitioners, the discontinuation of the bone-transference rite, and a general waning of interest among the young—accelerated by socio-economic change and urban influence—together threaten the continuity of both the ecological and the ceremonial knowledge. At the same time, the survival of the Niamtre calendar, the maintained monolith garden and the belief-protected groves shows that the system is not yet lost. This is precisely the juncture at which documentation and active safeguarding are most valuable.

IV. CONCLUSION

Nartiang demonstrates how, among the Pnar of the Jaintia Hills, religion and custom operate as an integrated system of biodiversity conservation and resource management. A sacred megalithic landscape, a network of belief-protected groves, a Niamtre ritual calendar synchronised with the farming year, a finely observed set of phenological indicators, conserved rice landraces and a substantial body of ethnobotanical and ethnomedicinal knowledge together constitute a coherent, locally adapted way of living in and with the environment. That this system persists in a single village—alongside a distinctive tribal-Hindu syncretism at one of the fifty-one Shakti Peethas—makes Nartiang an unusually complete case of bio-cultural heritage.

The same study, however, records the system's vulnerability to population pressure, expanding jhum and generational attrition. Three priorities follow. First, the provisional plant identifications in Tables 5 and 6 should be confirmed through herbarium vouchering, and the ethnomedicinal claims investigated pharmacologically. Second, the sacred groves warrant formal support—for example through a community-based sacred-grove conservation programme linked to the protected-area network and administered through the traditional institutions themselves, as the community's own leaders suggest. Third, the ceremonial and ecological knowledge held by elders and healers should be recorded in full while its custodians remain. Conserving this indigenous knowledge, and the habitat and institutions that sustain it, is essential both to the identity of the community and to the biological diversity that its beliefs have long protected.

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