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The Interplay of Indigenous Knowledge and Cultural Heritage: A Comparative Study of Traditional Calendars in Two Tangkhul Naga Villages

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***Abstract*:** In indigenous societies, the traditional calendar functions as a vital repository of ecological knowledge, intricately woven with cultural practices and seasonal rhythms. Rooted in generations of environmental observation, these calendars guide communities in the timing of agricultural labour, rituals, ceremonies, and resource management. As dynamic knowledge systems, they evolve in response to ecological shifts and societal change. This study examines the traditional calendars of two Tangkhul Naga villages, highlighting how each reflects distinct cultural expressions within a shared tribal identity. Drawing on ecological indicators and oral histories, the research explores how local knowledge systems shape and are shaped by environmental interaction and cultural values. By analysing both functional and symbolic dimensions of timekeeping, the study offers insight into the resilience, adaptability, and intra-cultural diversity of indigenous knowledge systems in the face of modern challenges.

Keywords: Agriculture, Cultural Heritage, Indigenous Knowledge, Oral Traditions, Tangkhul Naga, Traditional Calendar

I. INTRODUCTION

Climate patterns have long shaped how human societies relate to their environment, especially in indigenous communities where survival depends on careful observation of seasonal changes. Among such communities, timekeeping systems are developed through intimate, intergenerational knowledge of weather, flora, fauna, and agricultural rhythms. These communities have always been dependent on the natural environment for their sustenance, and hence, it was believed that the impact of climate change would affect them the most. However, studies over the years have come to a realisation that these indigenous communities had a resilient system that ensured a continuity of their way of life (Mavhura et al, 2013; Tom et al, 2019).

Indigenous people have been the forerunners of ecological knowledge systems that enabled them to survive despite varying environmental changes and ecological complications. They are inhabitants who have lived originally in a particular area for a long period, such that their socio-cultural beliefs, norms and customs are unique to their community. These people are rooted to nature in such a way that their skills, though inadequate when viewed from the scientific lens, guided them towards sustainable living by making them resilient and persistent against environmental changes (Berkes, 2009). They adapt by observing the environment around them, gaining insights from several time-tested experiments, techniques and practices (Berkes et al, 2000; Einbinder & Morales, 2019). These include keen observation and readings of seasonal variations and biological indicators to predict the weather, draw out the implications and decide on workable responses best suited for the particular situation. These knowledge systems are dynamic and intrinsically linked to the socio-cultural, economic and environmental factors associated with it (Mavhura et al, 2013; Yttredal et al, 2020).

Indigenous communities exemplify how ecological knowledge systems are embedded in everyday life. They make use of seasonal calendars or traditional calendars to mark and indicate the seasonal variations throughout the year. These variations could be an observed change in the behavioural patterns of certain flowering plants, birds, insects or animals, weather forecasting and the celestial cycles (Mao & Hynniewta, 2011; Bhagawati et al, 2017; Yang et al, 2019; Varah & Varah, 2022). Their calendars are not abstract constructs but practical guides grounded in environmental observation and cultural values, and they are resilient and locally specific systems for organizing agricultural and ritual life (Lokho et al, 2022). They are informed by careful, long-term observation of rains, appearance of specific plants, migration of birds, and other biological indicators.

Traditional calendars usually depict agricultural events due to the community's dependency on agriculture for livelihood. It records the agricultural cycle and festivals associated with such events, as well as the socio-cultural activities of the community throughout the year. These traditional calendars reveal the community's way of life, understanding of the environment, their belief systems and customary norms or laws. It is never simply a display of the year-long plans and activities of the particular community, but a reservoir of cultural history and cultural identity filled with indigenous knowledge accumulated over the generations that has sustained the community over the years. Traditional calendars prompt for exploration of cultural practices, local knowledge and their relation to timekeeping in a traditional context.

The region of Northeast India is home to an array of indigenous populations settled amongst a geographically rich ecological area. These indigenous populations are mainly dependent on subsistent form of agriculture wherein an ecological knowledge system guides them to make calculated decisions in terms of the use of resources and survivability. This particular paper would take into consideration, the traditional calendars of two Tangkhul villages (following Varah & Varah, 2022) to highlight the significance of indigenous knowledge in the formation of traditional calendars and examine the human-nature interaction that subsequently influences the society's cultural identity and vice versa. In the case of the Tangkhul Naga, such ecological knowledge is encoded in the names and meanings of each month, revealing how time is culturally constructed through close interaction with the land. Far from being static, these calendars are dynamic systems that adapt to local environments while preserving ancestral knowledge. The following study will also draw comparisons to show how different environmental, agricultural and social factors of the same tribe can be reflected through their traditional calendars.

II. LITERATURE REVIEW

Traditional calendars are foundational to how indigenous communities interpret time, structure agricultural life, and respond to environmental rhythms. Unlike standardised systems like the Gregorian calendars, traditional timekeeping systems are rooted in local ecological observations and socio-cultural meanings (Varah & Varah, 2022). These calendars represent not only practical tools for subsistence but also encode spiritual beliefs, rituals, and collective memory.

Several scholars emphasize the importance of traditional ecological knowledge (TEK) as a framework for understanding indigenous timekeeping. Berkes et al. (2000) argue that TEK is not static but adaptive, emerging from generations of close interaction with the environment. Calendars serve as one such adaptive system, enabling communities to respond flexibly to seasonal variability. Similarly, Mavhura et al. (2013) and Tom et al. (2019) underscore how indigenous knowledge systems- including seasonal indicators- support resilience and sustainable livelihoods, particularly in the context of environmental uncertainty.

Lokho et al. (2022) provide a focused discussion on calendar keepers in Northeast India, identifying them as "unsung heroes" of indigenous landscape management. These individuals draw on observations of phenological events- such as bird migrations, insect activity, and plant flowering- to structure community life and agricultural labour. This aligns with Einbinder and Morales (2019), who argue that true sustainability in agriculture depends not on external technologies but on the revival and recognition of local knowledge systems.

From a symbolic and anthropological perspective, scholars like Gerts (1973) and Evans-Pritchard (1939) have framed time not simply as a chronological sequence but as a cultural construction. Calendars, in this sense, represent systems of meaning as much as systems of measurement. This symbolic dimension is evident in studies like Bhagawati et al. (2017), who examined gendered patterns of seasonal labour among Galo farmers, and Mao & Hynniewta (2011), who explored the use of plants as seasonal indicators among the Mao Naga in Manipur.

Closer to the present study, Varah & Varah (2022) specifically examined seasonal change and ecological knowledge among the Tangkhul Naga, providing a rare localized account of how time is marked through both environmental and cultural indicators. However, while all these studies offer valuable insights, few explore intra-ethnic variation in calendrical systems- how different villages within the same tribe may encode time differently due to symbolic emphasis, leadership practices, or degrees of external influence.

This study stresses the gap by comparing the traditional calendars of two Tangkhul Naga villages- Kharasom[1] and Lairam Khullen (Lairam KL). Through an ethnological and symbolic-functional framework, it explores how ecological cues, cultural meanings, and social roles shape timekeeping practices at the micro-cultural level. In doing so, the study contributes to a deeper understanding of the diversity and adaptability of indigenous calendrical knowledge.

III. METHODOLOGY

The Tangkhul Nagas are an ethnic group of tribal community predominantly living in Ukhrul district (including Kamjong district)[2] in the state of Manipur. They are also found in other neighbouring northeastern states of India and parts of the neighbouring country, Myanmar. They are a population estimated to be 1,83,998 as per the 2011 census of India, living in a geographical area of 4544 square kilometres. The topography of Ukhrul district is terraneous with heights varying from 913 metres to 3114 metres. The hills are rich in biodiversity, home to several species of wild flora and fauna. There are estimated to be more than 200 Tangkhul villages scattered in the district, each with its own respective Headman or Chief (*Awunga*) and village council (*Hanga*) to govern and maintain the customary law and order. Tangkhul is the common language spoken, along with Meitei language. However, each of the villages also has its village dialect to communicate amongst themselves.

Agriculture is the primary occupation of the Tangkhul community, practised through two main systems: (a) wet terrace cultivation (*ngaralui*) and (b) shifting or jhumming cultivation (*ahanglui*). Villages situated in the northern and western regions of Ukhrul district, including Kharasom, generally engage in both wet terrace and shifting cultivation. In contrast, villages like Lairam KL, in the southern and eastern regions, tend to be smaller and rely predominantly on shifting cultivation. Rice serves as the staple food, accompanied by the cultivation of maize, pumpkin, ash gourd, yam, brinjal, green chilli, varieties of beans and several other crops. They also rear livestock, engage in poultry farming, fishery, and apiculture on an average scale. Other occupations include weaving, basketry, pottery making, salt making, timberwork and wood carving, which contribute to the community's subsistence and cultural livelihood. Apart from agronomy, several individuals are involved in public and private industrial sectors for jobs and career opportunities.

The selected area of study is two Tangkhul villages- Kharasom, in the northern corner of Ukhrul district and Lairam KL, in the southern corner of Ukhrul district. The villages were selected considering the geographical variation between the two sides. Household survey was carried out in each village to gather general demographic data and to estimate the agricultural types and patterns generally practised in the village.

The key informants consulted for in-depth gathering of information were predominantly the elders and community leaders of the villages, specifically those who were knowledgeable about the traditional calendars and who understood the significance embedded within their socio-cultural way of living. A total of 3 and 4 respondents from each of the villages were interviewed for in-depth data collection. Interview questions focused on month names, seasonal activities, environmental observations, festivals, and cultural practices associated with timekeeping. The respondents were gathered together for a focused group discussion wherein they could recount and cross-check each other's details of the traditional calendar, followed by a thorough analysis of its interpretations, indications and implications. Notes were taken, and local terminologies were carefully documented and interpreted with the help of bilingual speakers to maintain the accuracy of indigenous expressions. Data was also collected through observation during the fieldwork, which spanned over four months and casual interaction with the villagers while residing in the field areas.

This research was conducted with full respect for the cultural values and autonomy of the communities involved. Informed consent was obtained from participants, and the purpose of the study was clearly explained in accessible language.

[1] "Kharasom" in this study refers collectively to Kharsom CV, Kharasom Lazo, and New Kharasom. These villages originated from a single ancestral settlement and share a unified cultural and historical background, including the same traditional calendar system.

[2] Kamjong was carved out of Ukhrul district in 2016. As the latest census (2011) predates this division, this study treats Ukhrul in its undivided form.

IV. RESULTS AND DISCUSSIONS

The Tangkhul traditional calendar is divided into 12 months, the number of days of which are inconsistent with the Gregorian calendar. They are divided into 4 seasons: Spring (*Mayo*), Summer (*Lum*), Autumn (*Yangyir*) and Winter (*Si*) (Varah & Varah, 2022). According to respondents from Kharasom village, their traditional calendar was derived from the idea of the Gregorian calendar, which, when introduced to the villagers during initial interaction, was difficult for them to comprehend due to illiteracy. Hence, they came up with their traditional calendar to record and mark time and seasonal implications.

The traditional calendars of Kharasom and Lairam KL reflect two distinct yet interconnected systems of indigenous timekeeping rooted in ecological observation, cultural values, and agricultural practice (Table 1). Both villages mark time through seasonal cues such as the flowering of specific trees, the arrival of insects, and the behaviour of birds and animals. These ecological indicators shape their agricultural calendars and signal the timing of community-wide rituals and activities.

Table 1. Comparison between the annual calendar of Kharasom and Lairam KL

Name of month in English	**Kharasom**	**Lairam KL**
January	*Shiluirithse* *Shi* means house; implying that it is a good time to construct or repair houses	*Dhanu-ong* *Dhanu-ong* refers to the beginning; the beginning of the year
February	*Zeenithle* *Zeenitzuh* refers to the seed sowing festival; seed sowing can begin	*Kheitbiu-ong* *Kheibiu* refers to the bluntness of a knife, implying that the time has come to clear and burn the field
	Wild pear (*Kapaithei)* and peach (*mayangthei*) start budding, which implies that the season is warming	
March	*Samarahke* *Smarah* refers to the burning process soon after the clearing of forests; millet is sown in this period.	*Shemrem-ong* *Shemrem* refers to the levelling or aligning of the house; levelling the floor, veranda, aligning the roofs, etc.; houses are constructed in April but since they rest for the month after clearing the forest, they work on levelling their houses.
	Cuckoo (*koktui*) and nightingale (*sempeirok*) starts singing, signalling seeds can be sown Blooming of wild pear (*kapaiwon),* cherry (*saharwon*) and peach (*mayangtheiwon)* signal the warming of weather	
April	*Tsangsahle* *Tsangsah* refers to rainfall; the festival for rainfall *(tsangsahzuh)* is observed to pray for timely rain.	*Chamang-ong* *Chamang* refers to the process of bending to grab; the field has been cleared and ploughed. So, they go to clear the weeds
	Mushrooms start to sprout at this season due to sporadic rainfall	

May	*Avontsahle* *Avontsahle* draws its reference from how, before the villagers start seed sowing, the Headman or chief (*Awunga)* and his wife have to go and sow the first seed.	*Mzeir-ong* *Mzeir-ong* implies that the seed sowing period has started; the Headmen or chief (*Awunga*) and his wife should sow the first seed.
	Bayberry (*mahuithei)* and other varieties of berries starts ripening; Mushrooms are available in abundance; Rhododendrons *(kokluiwon)* starts to flower. Mosquitoes (*hachang)* and winged termites *(malum)* increase in number, signalling the rising temperature	
June	*Thohrahle* *Thohrahle* refers to the situation where nobody stays at home because everyone has gone to the paddy fields to sow seeds.	*Mtsir-ong* *Mtsir-ong* implies that the seed sowing period has come to an end.
	Frogs start croaking, and cicadas start to sing Wildlife animals prepare for the rain, and birds make nests for breeding.	
July	*Rohehle* *Ro* means “to roast”; July signifies the onset of caterpillars and worms, so yam leaves are burnt to keep them away.	*Nkhir-ong* *Nkhir-ong* imply that it was time to remove weeds from the paddy field; Weeding festival (*Luimao Phanit)* is observed before weeding begins.
	Fig (*khaorathei*) starts ripening and hunters wait beside the trees to catch deer and other wildlife. The smaller variety of bees and hornets are available for capturing and consumption.	
August	*Maezuh* *Mae* refers to the millet; Millet harvesting festival (*Maezuh*)	*Kharam-ong* *Kharam-ong* refers to the season when water is crucial for crops to grow
September	*Rezahle* *Rezah* refers to the thorough debating before making a decision; since they have to choose a new place to do their next cultivation on, they sleep and dream on it. If the dream gives a good omen, they will select that area otherwise, they will decide on another place.	*Site-ong* *Site-ong* refers to the warm weather which is still hot but cooler.
	Bauhinia (*haochakwon*) and sumac (*khamkhuithei*) flowering signals cooler weather.	

	Indian olive (*fashongthei*) also ripens, and hunters make use of this opportunity to lie in wait for wild animals.	
October	*Resoinheh* Since the seeds sown in the early months are harvested in June-July, the poor have to manage on little food; preparation for harvest is on full scale	*Sipiu-ong* *Sipiu-ong* refers to the period during which birds are chased away to prevent them from feeding on the crops
	The roads leading to the paddy fields are cleared and repaired; agricultural tools and items necessary for harvesting are polished and prepared as well.	
November	*Shuzuhle* *Shuzuh* refers to the process of harvesting paddy.	*Kade-ong* *Kade* refers to the paddy stalk that remains after threshing of the rice stalk; harvesting has begun; festival before harvesting (*Mahat Phanit*)
	Plum (*theikanthei*) and wild apple (*theithukthei*) will ripen, indicating the harvest season is coming to an end.	
December	*Thouchale/thouchohle* *Thouchohzuh* refers to the festival of the dead, where rituals are carried out to set free the spirits of family members who had passed away within the past year.	*Dabei-ong* *Dabei* refers to the sullen and broody period of rest as their work for the year is over, and they reflect on the work done throughout the year
	Gooseberry (*skekshuthei*) is found in abundance, and the nights are noisy with insects and owls.	

Cultural and symbolic differentiation: In Kharasom village, the calendar is richly embedded with symbolic and spiritual meanings. Months are named after rituals, environmental phenomena, and spiritual observances. Ceremonial events such as observing *Tsangsahzuh* (rainfall festival) and *Thouchohzuh* (festival of the dead) and rituals to release spirits reflect a worldview in which time, nature, and the sacred are intertwined. Conversely, Lairam KL presents a more functional and agriculturally driven calendar, with months named according to specific farming tasks such as *Mzeir-ong* (sowing), *Nkhir-ong* (weeding), *Sipiu-ong* (chasing birds), and *Kade-ong* (harvesting). Their months further signal household adjustments and field preparations. Though both systems are ecologically grounded, the differences highlight varying emphasis, i.e., ritual-symbolic in Kharasom, and task-functional in Lairam KL.

Agricultural rhythm and ecological observation: Both of the villages synchronise their agricultural activities with environmental cues.

a) February to July: Dominated by clearing, sowing, and pest control.
b) August to November: Marked by harvest preparation and actual harvesting.
c) December and January: Period of rest, ritual and domestic focus.

Biological indicators like the budding of flowers, cuckoo singing, cicada cries, and the appearance of winged termites serve as ecological signals for upcoming agricultural tasks.

Shared foundations, divergent expressions: Though both villages express their cultural identity differently in their calendars, the calendars are rooted in ecological observations and have been passed through oral traditions without any written record. They are also equally indicative of calendrical events triggering collective communal work or ritual. The linguistic variation in month names also reflects localised values- Kharasom's calendar is more diversified in symbolic content, while Lairam KL's is more agricultural and function-driven.

Every implication and indication within these communities stems from a shared reliance on ecological indicators such as weather patterns, flowering and fruiting plants, and the behaviour of birds, insects, and animals. While other communities follow broadly similar agricultural cycles, the way these environmental cues are interpreted and expressed in their calendars differs. This is because each community assigns symbolic value based on its cultural priorities and local meanings. As a result, although the underlying ecological knowledge is shared, the calendars reflect distinct cultural identities shaped by what each community chooses to emphasise and commemorate. This illustrates the principle of unity in origin, diversity in expression - a concept often applied to intracultural variation within indigenous societies.

V. CONCLUSION

Traditional knowledge systems are a product of experiences and practices that are observed by the particular community within their socio-cultural and environmental surrounding. Just as there are different methods of organising knowledge, communities in different environmental and socio-cultural settings have multiple ways of articulating this knowledge. Traditional calendars, thus, act as vital repositories of accumulated ecological knowledge, organised into a system of timely events whilst encompassing the important history and identity of the community itself. It is the interplay of agriculture, seasonal variation, biological indicators and cultural elements coming together to form a symphony of a well-balanced ecosystem.

The traditional calendars of Kharasom and Lairam KL are living archives of Tangkhul ecological knowledge and cultural logic. While both calendars fulfil practical agricultural functions, they also operate as expressions of identity- encoding values, leadership structures, and spiritual life.

Though these villages belong to the same ethnic group, the differences in their calendar reveal that cultural identity within the Tangkhul Naga is not monolithic. Rather, it is shaped by a range of interrelated factors. First, minor geographic and ecological variations influence how each village interprets seasonal cues and organises agricultural labour. Kharasom has more access to open fields and rivers, so they can practice both terraced and shifting agriculture and grow a stable variety of crops. Lairam KL is closer to forested hills, and while crops may grow well, their cultivation area keeps shifting every year. Second, the oral nature of transmission allows for flexible, community-specific adaptations in calendrical structure. Third, differences in historical exposure to external influences such as missionaries, colonial systems, and formal education also shape the symbolic content and cultural framing of the calendars. Lastly, locally embedded ecological perceptions construct and emphasise cultural meaning differently, thus highlighting the autonomy of local culture. Kharasom's calendar reflects a symbolic and ritualistic interpretation of time, whereas Lairam KL's is more functionally agricultural and rooted in the cycles of labour. These distinctions emerge from each village's unique interactions with nature, history, and social organisation. Thus, we find that within the broader Tangkhul identity lies a vibrant tapestry of local cultures. This coexistence of unity and diversity is what sustains the richness of indigenous knowledge systems and affirms the cultural autonomy of each village in shaping its rhythm of life.

By documenting and analysing these calendrical systems, this study contributes to the preservation of indigenous knowledge and emphasises the need for localised understandings of time, especially in regions undergoing cultural and environmental transformation. Future research may expand this inquiry by examining gendered knowledge of timekeeping, the role of youth in sustaining oral traditions, or conducting comparative studies across more Tangkhul or Naga villages to further map the rich diversity of indigenous ecological calendars.

All these knowledge systems are equally enriched by perceptions, beliefs and actions of that particular community, serving to fulfil the same goal – sustaining the community by judiciously making concerned decisions on the utilisation of resources from the environment they inhabit (Tom et al, 2019). It also acts as a tool for detecting changes in the environmental and biological elements brought about by global ecological issues.

Indigenous ecological knowledge has sustained the livelihood of indigenous communities for many generations, however, judging from the rate at which complications from climate change have been arising, these indigenous and marginalised community would have a tough time adapting to the current problems and face the risk of possibly losing themselves, their land, and their identity. There is a need for intervention from the scientific community, not to introduce scientific prospects haphazardly, but rather to properly value, safeguard and preserve these communities and their knowledge systems, engaging in plans and policies that would work to secure the local traditional systems while also developing them towards scientific synchronisation.

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