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Research article

Not Yet Extinct: Ao Naga Ethnomedicine and the Question of Survival

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Abstract

What does it mean for a knowledge system to survive? Not merely to persist as memory or samples but to remain living, practiced and transmitted, to understand how people shape and understand sickness and healing. The paper asks this question through the case of Ao Naga ethnomedicine in two villages of Mokokchung district, Nagaland - Longkong and Longmisa. Drawing on ethnographic fieldwork conducted across 2014, 2015, 2022 and 2026 the study documents practices where healing remains inseparable from household and forest. Plants are planted at doorways to ward off malevolent forces, leaves pressed onto snakebites with ritual touch, stems measured against injured bodies and kept over hearths where their work continues. What emerges is not random remedies but a coherent system where efficacy cannot be separated from belief, where healing addresses not just the wound but the spirit and community. The paper engages three debates in Indigenous Knowledge Systems scholarship. First, it frames the erosion of healing knowledge as systematic delegitimization driven by modern medicines, education, and religious conversion. Second, it argues that efforts to integrate traditional medicine into institutional healthcare often reproduce colonial hierarchies by demanding indigenous knowledge validate itself through biomedical standards. Third, it questions whether documentation alone ensures continuity. Against this backdrop, the paper proposes the 4C schema of Consciousness, Conservation, Cultivation, and Correlation as a community-centred framework for revitalization, emphasizing indigenous-led intellectual property protection. Survival is not enough. The question is whether Ao Naga ethnomedicine will be recognized as a legitimate way of healing - one that belongs in kitchens, on jhum fields, at hearths, not just in memory.

Keywords: Ao Nagas, ethnomedicine, Indigenous research methodology, knowledge pluralism, 4C schema, intellectual property rights

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Introduction:

Once I was attacked by some four bees (*Vespa mandarinia*, *notiti* – the local name), that have had infringed on the honey bee keeping machine at my home. They followed me till my courtyard from the downstairs where the bees are kept. I went down to the dispensary; the compounder gave me two tablets and an injection. That stopped the pain. Consequently, these days, the modern medicines are good since they are easily available and effective. (Respondent A, Longkong village, 2022)

This statement from an Ao Naga elder, recorded during fieldwork in 2022, captures the changing scenario in healthcare practices across Nagaland. It is not a rejection of traditional healing. The same elder, when asked about the nettle plant *Sangtsüng* (*Urticaceae* sp.), described how he still plants it by his doorway to keep malevolent spirits away. For him, and for many others in Longkong and Longmisa villages, two knowledge systems coexist, yet one is rapidly overshadowing the other. The elder's pragmatic acceptance of modern medicine, in this case 'two tablets and an injection', is accompanied by an enduring, if diminishing fashion, trust in the plants and rituals of his ancestors. This paper takes that ambivalence as its starting point.

The Ao Nagas are one of the major Naga tribes of Nagaland in Northeast India. Their traditional ethnomedicinal practices are embedded in a worldview where healing is never purely biological, but it is social, spiritual, and ecological. Plants and its usages as practices carry meaning and memory. A leaf placed at a door ward off evil. A stem measured against a pig's body and kept over a hearth prevents maggots. A tuber boiled for urinary tract infection is known as *Jongpongla entsü* (*Jongpongla's* egg), named after a spirit of the forest. These practices are not relics of distant past they are still performed, practiced and believed in primarily by elderly.

However, as Respondent A's response shows, modern pharmaceuticals, formal schooling, and decades of Christianity have systematically reshaped how Ao Nagas relate to their own healing knowledge. The result is a gradual delegitimization of an entire way of knowing. Young people below the age of 40, either do not know these practices or do not consider them effective. The knowledge is not yet extinct, but it is fragile that needs attention.

This paper asks a pertinent question, how can Ao Naga ethnomedicine survive as a living practice, not merely as documented memory? Survival here does not mean preservation in archives, cataloguing or displays in museums. It means being practiced in homes, transmitted to children, and trusted as real medicine – what the paper calls 'living survival'. Drawing on four phases of fieldworks (2014, 2015, 2022 and 2026) to two villages in Mokokchung district, the paper documents current practices, analyses the factors driving decline, and proposes a community-centred framework: the 4C schema (Consciousness, Conservation, Cultivation, Correlation) supported by intellectual property protections.

The paper is structured as follows. After a review of ethnopharmacology and existing studies on Naga ethnomedicine, the methods are described in detail, including a positionality statement acknowledging the author's insider status. The findings section presents ten plant-based practices and the observation that they are primarily held. The discussion introduces the pack concept of ethnomedicine and the distinction between curated survival and living survival. The 4C schema is elaborated, and the tension between cultural integrity and commercialisation is resolved by distinguishing correlation from extraction. The conclusion argues that survival is not a museum specimen, survival is when a grandmother teaches her grandchild how to plant by the door or when a family using *Rhus javanica* before running to the pharmacy.

Literature Review

Ethnopharmacology and the Cultural Context of Healing

Ethnopharmacology is the transdisciplinary study of how people use plants and other natural substances for healing that has recognised how “culture is at the heart of plant meaning” (Vandebroek & Moerman, 2015, p. 19). Unlike pharmacology, which isolates chemical compounds and measures their effects in controlled laboratory conditions, ethnopharmacology insists that healing events are shaped by local beliefs, rituals, and social relationships. Etkin and Elisabetsky (2005) describe the field as a transdisciplinary endeavour of biological and social sciences, primarily aimed at finding ideal cures for diseases while understanding the cultural logic that makes a remedy acceptable and effective for a given community.

Pieroni and Vandebroek (2007) emphasise that plant knowledge is dynamic that adapts to environmental change, migration and cultural contact. In this sense, a knowledge system that appears ‘traditional’ is always already ‘modern’ since it has changed over time, incorporated new elements while leaving certain traits behind. The Ao Naga ethnomedicine documented in this paper is no exception. What is observed today as ethnomedical practices is an ever-changing living tradition.

Moreover, healing almost always has a spiritual component. Even though the alleviation of sickness is biophysical, the transaction between patient, healer, and the non-human world, spirits, ancestors, forests, and domestic animals goes beyond the biophysical aspects. Among the Ao Nagas, the ritual touch after a snakebite (touching one’s own private parts before applying the hand to the wound) is not a pharmacological intervention it can be understood as a symbolic act of self-purification and communal solidarity. Visitors to the household asking “*Kua kechi koma?*” (“How is it?”) and the patient repeating the act each time reinforces a degree of social bond. A mere pure biomedical analysis cannot account for these dimensions.

One of the most influential demonstrations that biomedicine itself is a cultural construct is Miner’s (1956) classic satire “Body Ritual among the Nacirema”. Miner showed that the practices of modern healthcare, when described in unfamiliar terms, appear as bizarre as any “primitive” ritual. More recently, the call for ‘culturally competent healthcare’ (Anderson et al., 2003) recognises that effective treatment must consider the patient’s cultural knowledge and beliefs. Yet, as this paper will argue, mainstream “integration” of traditional medicine often demands that indigenous systems validate themselves by biomedical standards, which reflects a practice that often reproduces colonial hierarchies.

Ethnomedicinal Studies among the Nagas:

Nagaland is part of the Indo-Burma biodiversity hotspot, one of the most endangered ecoregions on earth (Myers et al., 2000; Sajem et al., 2008). The rich biodiversity has sustained diverse ethnomedicinal practices among the Naga tribes for centuries. Early ethnobotanical work among the Nagas includes Jamir and Rao (1990), who documented 50 medicinal plants used by the Zeliang community in Nagaland. Changkija (1999) provided a broader survey, listing 109 species of ethno-plants used across various Naga communities, noting that many species served multiple purposes – medicinal, culinary, and ritual. Lokho and Narasimhan (2013) described 63 taxa used by the Mao Naga of Manipur, a tribe closely related to the Nagas, and highlighted the importance of ritual contexts in plant use.

Chase and Singh (2013) focussed on the Angami Nagas, identified 64 medicinal herbs, of which 36 were used for treating more than one ailment. Their study noted that knowledge was rapidly declining due to the preference for allopathic medicine. Sumi and Shohe (2018) documented 50 ethnomedicinal plants among the Sumi Naga. All these studies emphasising the need for documentation before the knowledge disappears.

However, almost all these studies share a common limitation - they focus on plant identification, botanical properties, and pharmacological potential. They ask, 'what plants are used?' and 'what chemicals might be present?' These works have rarely asked 'how can/does this knowledge survive?' or 'what are the social, institutional, and spiritual conditions that allow a healing system to remain living?' The present study addresses this gap by shifting from a botanical cataloguing to an anthropological and policy-oriented analysis of knowledge decline and revitalisation. It does not dismiss the importance of pharmacological researches; however, it insists that such research must be situated within a broader understanding of the knowledge system as a whole.

Framework: Indigenous research principles

This paper is grounded in indigenous research methodologies rather than Western critical theory. Three principles from the work of Smith (2012), Wilson (2008), and Kovach (2010) guide the analysis.

First, the framework is relational accountability. Wilson (2008) argues that in indigenous research, knowledge is not owned by individuals but held in relationships, existing amongst people, between people and plants, the living and the ancestors, and the researcher and the community. The Ao Naga ethnomedical practices documented here cannot be understood outside these relationships. The 4C schema proposed later is an attempt to honour relational accountability by keeping the community at the centre of any intervention. The plants, the rituals, the beliefs, and the social conduct are not separate variables.

Second, decolonising purpose. Smith (2012) insists that research involving indigenous peoples should not merely describe or analyse. The research should actively work toward the wellbeing and self-determination of the community. This paper aims to contribute directly to the survival of Ao Naga ethnomedicine by proposing actionable policies (the 4C schema, IPR protections, local cultivation, intergenerational education). This approach is not a detached description of a dying culture vis-à-vis documentation, however, as a tool for revitalisation. The intended audience includes not only academics but also the Ao Naga community itself, state and national policymakers, and organisations working on indigenous health.

Third, refusal of epistemic extraction. A recurring critique of research on indigenous knowledge is that researchers 'take' stories, plants, and rituals, repackage them in academic language, and give nothing back (Smith, 2012; Kovach, 2010). All findings have been shared with the Longkong and Longmisa village councils. The author has committed to return the final output(s) to the villages with copies of any published paper and to assist in any community-led documentation efforts.

The paper does not rely on a Western theoretical lens (such as epistemic injustice or postcolonial theory) because such lenses, however well-intentioned, can become another form of epistemic authority imposed on indigenous realities. Instead, the analytical framework is the 4C schema itself, a community-generated response to the question of

survival. It is presented not as a universal theory but as a practical, situated framework for action.

Research Methodologies

Positionality Statement

The author of this paper is a member of the Ao Naga community. This insider position has both strengths and limitations. The author speaks the Ao Naga language (*Jungli* in spoken both villages) fluently and understands cultural norms, rituals, and social hierarchies. This enabled rapid establishment of trust, access to knowledgeable elders, and a shared understanding of unspoken rules, e.g., when it is appropriate to ask about healing rituals. Outsiders might have taken much longer to gain the same level of access.

The author's insider position may have led to assumptions of shared understanding (home blindness). For example, the author may have failed to ask for detailed explanations of certain rituals because they seemed obvious as an Ao Naga. There is also a risk of romanticisation or biasness with the community. To mitigate these risks, the author kept detailed field notes and objectivity was maintained throughout the process. The author declares no conflicts of interest. The study was conducted with the approval of the village councils of Longkong and Longmisa, and all informants gave informed consent (oral and written where possible).

Study Area

The study was conducted in two neighbouring villages of Mokokchung district, Nagaland, Northeast India, namely, Longkong and Longmisa. Both villages are approximately 40 minutes' drive from Mokokchung town, the district headquarters. They are situated in a hilly, forested landscape at elevations ranging from 800 to 1,200 metres above sea level. Jhum (shifting) cultivation remains a primary livelihood, alongside meagre wet rice cultivation and small-scale animal husbandry (pigs, chickens, and cattle). The villages have primary and middle schools and access to primary health centres, where allopathic medicines are easily available. The villages were selected because preliminary observations in 2014 suggested that ethnomedicinal knowledge was still relatively present compared to more urbanised areas (e.g., Mokokchung town itself), yet rapidly declining.

Fieldwork Periods and Data Collection

Fieldwork was carried out over three periods: 2014 (six weeks, June–July), 2015 (four weeks, December), and 2022 (eight weeks, April–June). The longitudinal ethnographic approach allowed the researcher to observe changes over an eight-year period. The study adopted an anthropological approach combining three primary methods:

a. In-depth unstructured interviews with key informants (ritual specialists, healthcare workers, and ethnomedicine practitioners), all above the age of 40: The age threshold was chosen because pilot interviews indicated that people below 40 rarely knew or trusted traditional practices. Interviews lasted between 45 minutes and two hours, often conducted in the informant's home, at jhum fields and walks in the forest. Topics included: plants used for specific ailments, preparation methods, associated rituals and beliefs, sources of knowledge (e.g., from parents or grandparents), changes observed over the informant's lifetime, and attitudes toward modern medicine.

b. Participant observation: The researcher accompanied elders on forest walks to collect plants, observed household healing events (e.g., treatment of a pig's injury, preparation

of *Rhus javanica* powder), and participated in community discussions about health. Detailed field notes were written each evening, recording not only the practices but also the social context, the role of gender and age, and the emotional tone of events.

c. Focus group discussions: Three groups, each with 5-8 participants, were convened to validate plant names, preparation methods, and to discuss community-level perceptions of ethnomedicine's decline. One focus group was composed of knowledge keepers' men only, one of women only, and one mixed. The mixed group was particularly lively, with younger women (in their thirties) expressing scepticism about traditional remedies.

Informed consent was obtained orally and in writing where applicable. The researcher explained the purpose of the study, how the data would be used, and that participation was voluntary. Respondents were assured of anonymity; pseudonyms are used for individuals quoted in this paper.

Sampling and informants

Purposive sampling was used to select tiger-men and traditional healers (specialists) who are believed to have special spiritual power and knowledge over wild animals, plants and wounds, and recognised village elders. The tiger-men are a dying category; only two self-identified tiger-men were found (one in Longmisa and the other in Khar village). Informants range from the age of 40 to 86 (for knowledge keepers), to younger groups such as youths of the villages to capture the different viewpoints. All interviews were conducted in Ao Naga language.

Data analysis

Data were analysed thematically. Transcripts were coded for the following themes: (a) plant species and preparation methods, (b) ritual and belief components, (c) perceived causes of knowledge decline, (d) intergenerational transmission (or lack thereof), (e) attitudes toward modern medicine, (f) gender differences in knowledge, and (g) suggestions for revival. The resulting ethnomedicinal table (Table 1, Jamir, R., 2026) was cross-checked with published botanical identifications from Changkija (1999) and Kichu et al. (2015) to confirm scientific names where possible. Where a species could not be identified to the level of species (e.g., *Urticaceae* sp.), the family name is given, following standard practice in ethnobotanical reporting.

Limitations

In addition to the positionality limitations already noted, the study has several other constraints. First, it is confined to only two villages. Therefore, findings may not be generalisable to all Ao Naga communities, let alone to other Naga tribes. However, the in-depth qualitative approach provides rich detail that surveys cannot capture. Second, reliance on memory of elders introduces possible recall bias. Informants may have idealised the past or forgotten practices that were once common. Third, no clinical efficacy tests were conducted. The focus was on documenting the system as it exists, not on validating it pharmacologically. This paper does not claim that all ten remedies are effective by biomedical standards, nonetheless, it claims that they constitute a coherent knowledge system that deserves recognition and respect. Fourth, the long gap between 2015 and 2022, and 2026 meant that some changes (e.g., the death of some key informants, some elders) could not be observed in real time.

Research Findings

Overview of documented practices

The study identified ten distinct ethnomedicinal practices (summarised in Table 1). The table lists the plants, their local names, the form used, and the condition treated. The table is derived from the author's fieldwork notes and cross-checked with informants in focus group discussions.

S. No.	Plant	Used as	Used form	Used in
1	<i>Urticaceae sp.</i>	Elixir	leaves	Used as a good luck omen and in premonition
2	<i>Colocasia esculenta</i>	Tourniquet	leaves	Snake bites
3	Cogan grass	Tourniquet	leaves	Snake bites
4	Bamboo	Hemostasis	Scraped off residual nodes	Cuts
5	<i>Caryota sp.</i>	Hemostasis	scraped-off residue	Cuts
6	<i>Rhus javanica sp.</i>	Preventive	pounded seeds	stomach pain, food poisoning, diarrhoea, and nausea
7	<i>Ocimum bassillum sp.</i>	Preventive	leaves	body temperature, acidity, nausea, and diarrhoea
8	<i>Costus sp.</i>	preventive	stem	treating injuries in domesticated animals and tooth pain in humans
9	<i>Nephrolepis exaltata</i>	Healing	tuber	Urinary Tract Infections
10	<i>Drymaria cordata</i>	Clearing/protective	Fresh leaves, crushed	sinusitis, nasal congestion (humans) and skin rashes (pigs)

Table 1: Ethnomedicinal Plants and Practices among Ao Nagas (Source: Fieldwork in 2014–2026)

Detailed description of selected practices

Sangtsüng (*Urticaceae sp.*) as an elixir

The most culturally significant plant is *Sangtsüng*, which translates roughly as “praise leg” (*sang* = praise, *tsüng* = leg). Its uses extend beyond healing into social and spiritual domains. One elder, a former village council member aged 70, described three distinct uses:

When we went to another village to make peace after a fight, we would put a leaf of Sangtsüng in our pocket. It brings good luck. Also, when I go into the deep forest, I put a leaf on my ear. Traditionally, the wizard, Sangpongi, he also does that. And if someone has pain, we rub the leaf on the skin. It works.

Even today, many households in Longkong and Longmisa plant *Sangtsüng* near their doorways. For any sickness, fresh or dried leaves are placed near the door as a hex, believed to block evil eyes or ill doings by spirits. The practice is not performed with scepticism, as informants spoke of it with quiet confidence.



Figure 1: An Ao Naga council member adorns himself with *Urticaceae* sp. as a good luck omen (Source: Fieldwork 2022)

Snakebite Treatment: Taro and Cogan grass:

Snakebites are a serious concern in the forested hills. The traditional first response, still known to all elders, is to crush taro (*Colocasia esculenta*) leaves and apply them generously to the wound. The taro leaf is believed to draw out the venom, though no informant could explain the mechanism in biomedical terms, only that “it has worked for our grandparents.” Additionally, a ritual act is required. The affected person must touch their own private parts (genitals) and then place the same hand on the wound. This act, which may be uncomfortable for younger generations, was explained by an elder as follows: “Your own body is pure. The spirits fear that purity. When you touch yourself and then the wound, the poison knows it cannot stay.”

Visitors to the household would ask, “Kua kechi koma lir?” (“How is it?”), and the patient would repeat the entire ritual each time - touching, placing the hand, and affirming that the wound was improving. Thus, creating a social bond of care, reinforcing the patient’s role in the community. Members of the same age set would observe a day of rest and refrain from manual labour (*anempong*), a practice that combined physical recovery with social solidarity.

Cogan grass (*Imperata cylindrica*), known locally as *azü*, is used as an alternative tourniquet. Among the grass, a special leaf that stands upright and flickers in the wind (*azümong nung lashi lashia aliba*) is carefully selected. The selection is not random; the behaviour of the leaf that stands alone and moves in the wind is interpreted as a sign of strength and life. That leaf is tied around the bitten area to stop blood flow and, symbolically, to ‘tie up’ the venom.

Keyi naro (Hellenia speciosa) for injuries in pigs and humans

Known as the “tiger plant” (*keyi* = tiger, *naro* = plant), *Keyi naro* occupies a special place in Ao Naga ethnomedicine because it bridges human and animal care. Pigs are integral to Ao Naga social life, they are used in reconciliation ceremonies, dispute resolution, and festivals, and they also serve as a source of food and income. When a pig is injured, the owner measures the whole length of the pig with a stem of *Keyi naro*. The stem is then kept over the hearth (the central fireplace in the traditional Ao house). Informants explained that the hearth’s warmth and smoke keep maggots away from the wound. One elder state, “the pig is like family. You treat it like you would treat your child. The plant knows that.”

For human toothache, a short stem of *Keyi naro* is used to measure the inside of the mouth, from the aching tooth to the opposite side. The stem is again placed over the hearth. The practice is governed by conscious adherence. The patient must believe, and the healer must perform the act with appropriate conduct (no rushing, no careless handling).



Figure 2: *Keyi Naro/Costus sp.* (Source: Fieldwork 2022)

***Nephrolepis exaltata* tubers for UTI**

Epiphytic sword ferns, *Nephrolepis exaltata*, grow on the trunks of the palm of *Livistona chinensis*, which is itself cultivated for traditional roofing and broomsticks. The fern produces underground rhizomes that form small tubers, locally called *Jongpongla entsü* or *Jongpongla's egg*. *Jongpongla* is a forest spirit, naming the tuber after the spirit indicates that the plant belongs to the forest's own domain and must be collected with respect. The tubers are collected, boiled in water for about 20 minutes, and the water is consumed as a treatment for urinary tract infection. This practice is still known and occasionally used. A female informant aged 55 notes: “When I was a girl, my mother did this for me. Now I do it for myself, but my daughter she wants to go to the doctor in town.”



Figure 3 & 4: Epiphytic/Boston ferns on the stem of *Levistona Chinesis* sp. (left) and *Nephrolepis exaltata* underground rhizome as tubers (right) (Source: Fieldwork 2022, 2026)

Pepeyu (*Drymaria cordata*) for nasal clearing and skin rashes in pigs

Pepeyu is a small, creeping herb with soft, kidney-shaped leaves, commonly found in moist, shaded areas near jhum fields, forests and even around households. Among the Ao Nagas, it is valued for two distinct purposes.

For humans suffering from sinusitis or nasal congestion, a handful of fresh Pepeyu leaves are roughly crushed by hand and held close to the nose. The sharp, green, almost peppery aroma is inhaled deeply, and within moments the nasal passages clear. There is no elaborate preparation no boiling, no pounding into paste. The remedy is immediate, sensory, and entirely dependent on the freshness of the leaf.

The same plant serves domesticated pigs. When a pig shows signs of skin irritation or rashes, often from lying in damp pigsty or from insect bites, fresh Pepeyu leaves are crushed and rubbed onto the affected areas. Pigs that receive Pepeyu regularly are said to be less prone to skin troubles. What is remarkable is that the same rough crushing by hand used for human sinuses is also used for the pig.



Pepeyu (*Drymaria cordata*) growing in the soil (left) and crushed onto a piglet's skin for rashes (right) (Source: Fieldwork 2026)

Intergenerational Observations

The most striking finding of the fieldwork is the stratified opinions. All 28 informants who could name and describe the practices in Table 1 were above the age of 40. When the researcher asked people below 40, including family members of the informants, the

responses fell into two categories: ignorance and scepticism. Several informants over 50 expressed distress about this gap. One elder said: “I have told my son many times about the plants. He listens, but he does not remember. He does not believe. When I am gone, who will teach his children?” This observation captures the crisis. The knowledge is not yet extinct. The practices are still prevalent without active transmission to the younger generation. It will become what this paper calls *curated survival* (knowledge preserved only in archives as documentation) rather than *living survival*.

Discussion

Ethnomedicine as a pack of four inseparable components

The findings demonstrate that Ao Naga ethnomedicine is more than a list of plants. It is a pack of four inseparable components: (1) the plant or material itself, (2) the ritual action (e.g., touching private parts, measuring the pig, keeping the stem over the hearth), (3) the belief (e.g., that the leaf wards off spirits, that the stem prevents maggots), and (4) the social conduct (e.g., the *anempong* or the day of rest) (Jamir, R., 2023). These four components are mutually fundamental. Remove the belief, and the ritual becomes empty. Remove the social conduct, and the healing becomes isolated, losing its communal reinforcement. Remove the plant, and nothing remains.

This pack concept has important implications for how ethnomedicine should be studied. Laboratory testing that isolates only the plant’s chemical compounds while ignoring the ritual, belief, and conduct does not account for Ao Naga healing. Such studies only document a dead specimen. As Vandebroek and Moerman (2015, p. 22) writes, culture is “the indispensable link” between a plant and a medicine. When we break that link, it produces just a mere museum piece and not a healing practice.

Consider the case of *Sangtsüng*. A laboratory can identify alkaloids, measure anti-inflammatory activity, or test toxicity. What the laboratory cannot capture is why the leaf is planted by the doorway (the belief system that involves malevolent spirits), what the elder intends when rubbing it on pain (intentionality), how the patient’s belief affects recovery, and why the community trusts the practice (social capital). All these components are imperative and inseparable constituents of Ao Naga healing.

Drivers of decline

The decline of Ao Naga ethnomedicine is an inevitable result of ‘progress.’ The fieldwork identified three interlinking factors that have systematically delegitimised this knowledge system.

The first factor is the impact of allopathic medicines. All informants acknowledged that allopathic medicines are faster, more convenient, and widely available. Respondent A’s quotation about the bee sting is representative of the changing attitude towards ‘modern medicine.’ The speed and convenience of the new readily available medicines have shifted the baseline of what counts as effective. Traditional remedies often take time, a leaf rubbed on pain may provide gradual relief yet may not be instant as anaesthesia.

Secondly, school curricula in Nagaland (and across India) do not include ethnomedicine. Children learn about plants in biology classes, restrictively only through the lens of botany and chemistry. They do not learn about the ritual, belief, and social contexts that make ethnomedicine meaningful. The implicit message of modern education is that legitimate knowledge comes from textbooks, laboratories, and certified experts. An elder’s knowledge, passed down orally, is devalued by comparison.

Thirdly, conversion to Christianity. Over the past century, American and European missionaries converted the vast majority of Ao Nagas to Christianity. While the churches have provided education and healthcare, they also actively discouraged traditional religious practices, including many forms of ethnomedicine that involve spirits, rituals, and non-Christian beliefs. The effect was not always direct prohibition but a slow erosion of cultural legitimacy. A Christian Ao Naga today might still use *Rhus javanica* powder for diarrhoea, but they would avoid the ritual aspects deemed as either “sinful” or “backwards.” Over time, the practice got eroded. Now, the plant might remain; however, the ritual and belief were/are slowly stripped away.

Curated survival and living survival

Most existing efforts to preserve traditional medicine aim at what this paper terms ‘curated survival.’ Curated survival is the knowledge that is documented, archived, photographed, and stored in databases, museums, or books. The knowledge is dead but preserved. It can be consulted by researchers but is no longer part of everyday life. The community may have a sense of pride that their knowledge is salvaged or documented but they do not use it.

Whereas the alternative is living survival. Living survival is the knowledge that is practised in homes, transmitted from elders to children, trusted as real medicine, and adapted to new circumstances. This, therefore, is a dynamic and breathing system. It changes over time, with new plants being added, but it remains a living part of the community’s everyday life.

The 4C schema is designed to shift from curated survival to living survival. It does not reject documentation – documentation is necessary – but it insists that documentation is only the first step. The real work is creating conditions under which the knowledge continues to be used and transmitted.

The 4C Schema: A Community-centred framework:

Based on interviews with elders and the author’s participant observation, the paper proposes the following four pillars. Each pillar is accompanied by practical actions.

Consciousness: Younger generations need to recognise the value of ethnomedicine as a legitimate way of healing. This requires:

- a. School modules (approved by the Nagaland Board of School Education) that teach ethnomedicine alongside biology, emphasising the pack concept and the cultural significance of plants.
- b. Community storytelling events where elders are invited to share their knowledge in a respectful setting, with more younger people required to attend.
- c. Intergenerational workshops where elders and youth together prepare remedies and discuss the associated rituals.

Conservation: The plant species themselves are at risk due to less awareness and changing climatic conditions. Conservation actions include:

- a. Mapping of plant locations using GPS and participatory GIS, with data owned by the village councils.
- b. Protection of forest patches where medicinal plants grow, possibly through community-managed forest reserves.

- c. Sustainable harvesting rules for collection. This includes collecting only a certain number of leaves from each plant.

Cultivation: Waiting for plants to grow wild is not enough. Key species must be actively cultivated to prevent their disappearance. Some actions here include:

- a. Household nurseries or incorporating the planting of the plants in kitchen gardens. Some of the plants grow easily and require little maintenance.
- b. Seed banks and tissue culture for rarer species (though none of the nine in Table 1 is currently endangered, proactive cultivation is prudent).
- c. Linking cultivation to livelihood. Communities could produce and sell *Rhus javanica* powder under a local brand (example: Khar Moli from Khar village).

Correlation: Correlation means connecting traditional knowledge with modern healthcare on community terms with consent. It does not mean integration that demands biomedical validation. Actions include:

- a. Dialogue-based research: when a pharmaceutical company or university wants to study a plant, they must first obtain community consent, agree to benefit-sharing, and co-design the research protocol.
- b. Establishing a knowledge bank like a traditional knowledge register at the village level, documenting who knows what, with secrecy provisions where appropriate.
- c. Creating a formal alliance between traditional healers and the Primary Health Centre (PHC) so that patients can choose between or combine systems.

Intellectual Property Rights (IPR) are a cross-cutting theme. The paper recommends community-registered patents with benefit-sharing agreements. Under the Indian Patents Act (2005), traditional knowledge cannot be patented by outsiders, but communities can file for patents on specific applications with the help of legal aid.

Geographical indication (GI) tags for specific Ao Naga remedies. GI tags prevent outsiders from using the local name and ensure that economic benefits flow to the community.

Safeguarding local secrets through “secrecy regimes and ritual regimes” (Wilder, 2000). Not all knowledge should be documented. Some rituals are esoteric and meant only for initiated healers. The community has the right to keep those secrets.

Resolving the Tension: Correlation is not Extraction

A legitimate concern arises: if ethnomedicine is a pack that cannot be broken, how can the 4C schema advocate any form of commercialisation or linkage with drug development? The answer is a clear distinction between extraction and correlation.

Extraction is taking plants, ignoring rituals and beliefs, patenting chemical compounds without the community’s consent and keeping profits away from the knowledge holders. Extraction destroys the pack and commits a form of cultural theft.

Correlation is community consent, benefit-sharing (monetary or non-monetary), IPR protection, and respect for the pack. It means that any research or commercial use acknowledges that the plant is embedded in ritual, belief, and conduct. Correlation keeps the pack intact while allowing ethical collaboration.

Comparative Case Study: The Khar Moli Model:

The *Khar Moli* is an indigenous medicinal powder from Khar village, Mokokchung district in Nagaland provides a successful model. *Khar Moli* is used for food poisoning, stomach

upsets, diarrhoea, and blood sugar control. The community has organised itself to produce and market the powder, and it has gained recognition across Nagaland. The key lesson from *Khar Moli* is it is community-owned. The recipe and production method are controlled by the village itself. Subsequently, quality control is maintained, where the community ensures that only authentic ingredients are used. Finally, branding of the product, where currently, *Khar Moli* is sold under a distinct name associated with the village.

The 4C schema for Ao Naga ethnomedicine would similarly benefit from a pilot project focusing on one or two products. For example, *Rhus javanica* powder (for diarrhoea) and *Nephrolepis exaltata* decoction (for UTI). These could be produced, packaged, and sold locally, with proceeds funding community-led conservation and education programmes.

What survival looks like

The paper concludes by stating that survival is not a well-documented book on a shelf, a plant pressed in an herbarium, or a conference talk. Survival is a grandmother teaching her grandchild which leaf to use at which sickness. Survival is when a plant is grown by the doorway or when a family reaches for *Rhus javanica* powder when someone has diarrhoea instead of running to the pharmacy. This is the meaning of “not yet extinct”. It refuses to accept that indigenous knowledge belongs only to the past or to the archive. It insists that Ao Naga ethnomedicine can be a legitimate, contemporary way of healing. The 4C schema is a practical roadmap to get there.

Conclusion

This paper has argued that Ao Naga ethnomedicine is a coherent, living system where plant, ritual, belief, and conduct are inseparable. The decline of ethnomedicinal significance is driven by modern medicine, formal education, and religious conversion, forces that have systematically delegitimised indigenous ways of knowing. Documentation alone aims only towards curated survival, which is insufficient. What is needed is the living survival that accounts for practice, transmission, and trust. The 4C schema (Consciousness, Conservation, Cultivation, Correlation) offers a practical, community-led path toward that goal, supported by intellectual property protections that prevent extraction while allowing ethical collaboration.

The paper makes three specific recommendations for different stakeholders:

- a. For the villagers, establish a Traditional Knowledge Committee comprising elders, women, and youth. The committee would oversee documentation, decide which knowledge can be shared with outsiders, and manage any commercial agreements.
- b. For policymakers in Nagaland and India, amend school curricula to include local ethnomedicine as part of science education, not as folklore but as a legitimate knowledge system. Provide funding for community-led conservation and cultivation of medicinal plants. Strengthen the enforcement of GI tags and benefit-sharing provisions under the Biological Diversity Act (2002).
- c. For researchers, adopt indigenous research methodologies that prioritise relational accountability and community benefit. Before studying an ethnomedicinal plant, obtain community consent and co-design the research. Publish in open-access venues so that communities can read the results.

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