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Understanding Tribal Health Governance in Assam

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Abstract

This paper examines differentiated health vulnerabilities among tribal communities in Assam through a comparative and syndemic framework. It argues that tribal health in India reflects a "quadruple burden" of communicable diseases, non-communicable diseases, malnutrition, and mental health conditions shaped by structural inequalities, geography, culture, and governance. Existing health policies often overlook tribal distinctiveness by subsuming tribal health within rural healthcare and treating diverse tribal groups as a homogenous "Scheduled Tribe" category. Such approaches obscure significant intra-tribal variations in health outcomes.

Focusing on Assam, the paper compares hilly tribes such as the Karbi and Dimasa with floodplain communities such as the Mising and Deori to show how ecology, governance, and health-seeking practices intersect to shape vulnerabilities. By foregrounding intra-tribal differences, the paper contributes to debates on context-sensitive and inclusive public health policies for tribal populations in India.

Introduction:

The Indian tribal populations represent one of the country's most acute and multi-layered public health crises that remain inadequately addressed despite decades of policy recognition. These inequities manifest as a "quadruple burden" comprising communicable diseases, non-communicable diseases, malnutrition, and mental health conditions. Constituting around 8.6% of the nation's population, 705 tribes total approximately 104 million individuals who experience differentiated health vulnerabilities that are further complicated by their distinct geographical positioning, health-seeking behaviours, socio-religious and magico-religious beliefs, traditional indigenous health interventions that run parallel to modern institutionalised medicine, and customary practices (Linda et al., 2024). This burden is not merely additive reflecting a simple aggregation of diseases but this constitutes a syndemic (Shelke et al., 2023); patterned, mutually reinforcing interaction of biological conditions with social, political, and economical determinants. This multi-faceted disease burden is not randomly distributed but rather systemically concentrated among specific population clusters like the tribal communities, which indicate that structural and political factors, not merely biological or behavioural factors, drive health outcomes.

The Expert Committee on Tribal Health (2027 Roadmap) explicitly acknowledges the limitations of conventional health systems in addressing tribal health disparities and recommends the integration of parallel structures like traditional healers and tribal youth in health-related professions (Kumar et al., 2020). But this creates friction as recent studies indicate an apparent mismatch between the changing health profile of the tribal population and current healthcare infrastructure, policies and approaches to universal healthcare. Broadly, the existing discourse reflects two critical blind spots that have impeded the effective formulation and implementation of tribal related health policies in India:

The overlooking of the distinctiveness of tribal health led to its integration into rural healthcare based on incorrect assumptions about similar health needs to those of rural people.

The tendency to treat tribal groups as a homogenous "Scheduled Tribe" category, which led to the erasure of crucial differences in geographies, ecology, culture, local governance, epidemiological profiles and social marginalities, obscuring substantial intra-tribal variations that shape health vulnerabilities and determine health outcomes in unique and meaningful ways.

Assam provides an ideal context for examining differentiated tribal health vulnerabilities because it exemplifies the geographic and cultural heterogeneity characterising the broader Indian tribal health crises. Home to around 1.3 million tribal people representing diverse communities, Assam is divided into specific ecological zones bearing distinct tribal groups. The state's hilly regions such as Karbi Anglong, North Cachar Hills, and Dima Hasao are inhabited primarily by Karbi and Dimasa tribes while the Brahmaputra valley and its floodplains are largely populated by Mising, Deori and other riverine tribes. These communities differ intrinsically from each other not only in terms of geographical positioning but also in terms of culture, epistemologies, governance, health-seeking behaviours and others. Yet Assam's tribal health landscape remains relatively under-explored and understudied in relation to central Indian contexts. No comprehensive literature has yet looked at how geography, governance and culture of hilly and plain tribes of Assam intersect to produce intra-tribal variations in health outcomes through a comparative and syndemic lens.

Identification of the Problem

When it comes to tribal health studies in Northeast India, especially Assam, it remains largely underrepresented despite its high concentration of indigenous people (Linda et al., 2024). Assam exemplifies this geographic and ethnic heterogeneity due to its distinction of hilly tribes like Dimasa and Karbi which inhabit the mountainous terrains near the Cachar region, from the plain tribes like Deori and Mising which reside in the floodplains and riverbanks of the Brahmaputra valley. The tribes' varied geographical contexts (hilly versus plain), governance structures (autonomous versus state-administered), and cultural systems (different languages, traditional magico-beliefs, and healing systems) oppose the plausibility of clubbing them under a blanket category of Scheduled Tribes (STs). The absence of rigorous research that provides disaggregated, geographically differentiated, politically analysed evidence on how communities health vulnerabilities differ. prevents three critical advancements :

Targeted Trib-Specific Policy Interventions: Policymakers, despite their best efforts, fail to target interventions appropriately because there is a lack of evidence on how health vulnerabilities differ by tribe, geography, and specific socio-political conditions.

Structural diagnosis of intra-tribal differentiated health vulnerabilities: Due to a paucity of studies focused on the intersection of geography, governance, and culture and how they interact to produce health outcomes, the politics of tribal health in Northeast India is yet to be fully explored. Existing scholarship has only looked at barriers (poverty, remoteness, and language) but they have not yet explored health as a product of the social and political: how power relations, cultural structures, distinct ontologies, and historical marginalisation continue to produce and perpetuate different levels of health vulnerabilities across different contexts.

Framework for Rights Advocacy: disaggregated data on specific tribal communities' health challenges, barriers, and unmet needs helps them to identify themselves as separate subjectivities from aggregated "tribal" categories. This helps them to leverage their power and position within the existing the political structure, to negotiate and demand for targeted responses from the state.

Therefore, the central research problem is how health vulnerabilities differ between and within tribal communities across different ecological and governance contexts (specifically hilly versus plain tribes in Assam) in what structural political and ecological factors drive these differentiated patterns? This problem is simultaneously empirical, requiring documentation of health differences, analytical, ontological and political.

India's 104 million tribal citizens, constituting 8.6% of the national population, spread across 705 distinct communities, face presently, one of the most challenging epidemiological paradoxes: despite years of explicit constitutional mandates, comprehensive health policy frameworks, and crores of public health investments, the health of tribal people has barely improved since the time of colonialism (Linda et al., 2024; Kumar et al., 2020). Tribal people have remained persistently among the most marginalised groups in the country across virtually every indicator of health and well-being (Sachchidananda, 1994; Kumar et. al., 2020). Maternal mortality among tribals is still higher than that of non tribal populations by 40%, with infant mortality rates between 50-70 per 1000 live births while the national average is 28, and the widespread prevalence of child malnutrition almost 2-3 times higher than that of non tribals (Kumar et al., 2020; Soman et al., 2024). The Constitution of India, through successive judicial interpretation of Article 21, has recognised health as a fundamental right (Singh, 1994) and yet the gap between constitutional aspirations and the actual lived realities of tribal people remain widened, structurally entrenched, and largely irreconcilable. Health, as defined by WHO (1994) is the complete physical, mental, and social wellbeing of an individual instead of simply the absence of disease. The fact that such glaring disparities are still as pronounced, even after being acknowledged, underscores the argument that these issues are not simply a result of poor implementation at local levels or limited resources and infrastructure but compounding effects of geography, poverty, ecological disruption and systemic neglect of their ethnomedicinal and traditional epistemologies and ontologies.

Against this uneven national backdrop, the northeastern state of Assam emerges as a complex case study. Assam is a home to numerous scheduled tribe communities which are distributed across diverse ecological zones ranging from hilly terrains of Karbi Hills, Cachar, and Dima Hasao to the fertile floodplains and riverine valleys of the Brahmaputra. Among its several tribal communities, the Karbis and Misings occupy distinct ecological niches, inherit different social structures, cultural frameworks and language, and face different configurations of health vulnerability and healthcare inaccessibility. Despite being two of the most prominent tribal groups in the state, comparative health research of their differential health vulnerabilities, ethnomedicinal and traditional knowledge systems targeting these communities are conspicuously absent from the current literature.

Health Status, Disease Burden and Health-Seeking Behaviours among Tribal Populations

The conceptualisation of tribal health among tribal communities in India has been one of the most contested topics from a policy discourse lens. Mahapatra (1994) argued that health among tribals can be best understood from a functionalist perspective rather than a clinical symptomatic approach. The primary marker of illness for a tribal person is defined by their withdrawal from the productive, economic and social sphere of activity. Sachchidananda (1994) in contrast, located tribal health as a cultural complex, in other a part of social structure and organisation that continuously keeps adapting to changes in the broader society. Singh (1994) on the other hand, identified nine interacting factors, which includes variables such as physical environment, nutritional availability, psychological culture, therapeutic systems and others, as jointly capable of determining tribal health outcomes.

While the literature diverges on how to best articulate tribal health while encapsulating all its dimensions, these early formulations do converge on a crucial argument– that illness and treatment cannot be understood in isolation from the ecological, social, and cosmological environments in which tribal communities live (Sachchidananda, 1994). This understanding is more closely aligned to contemporary frameworks such as the Social Determinants of Health (SDoH) model, which defines economic stability, physical environment, education, and community context as the primary drivers of health outcomes (Soman et al. , 2024), and the syndemic framework, which highlights the amplifying role of structural conditions in shaping disease interaction (Shelke et al., 2023). Therefore the health status of Karbi and Mising communities cannot be reduced to epidemiological enumeration alone. It requires contextual, community-embedded analysis that captures the cultural sensitivities, ontological orientations, ecological determinants and structural conditions that shape both disease occurrence patterns and health-seeking behaviour.

When it comes to the disproportionate and multi-dimensional disease burden borne by the Indian tribal populations. Kumar et. al. (2020) articulate this as a 'quadruple disease burden,' which encompasses communicable diseases, non-communicable diseases (NCDs), malnutrition, and mental health and addiction-related conditions. While drawing data from national surveys such as the National Family Health Survey (NFHS) and Census, they demonstrated that health disparities between tribal and non-tribal groups are starkly represented across virtually all major health indicators and metrics. Their analysis, which is framed within the health equity and primary healthcare principles derived from the Alma-Ata declaration, argues for context specific and context-sensitive primary care, as well as the training of local health workers as potential solutions to relieve this burden. Linda et al. (2024) strengthen this argument further by delineating the historical trajectory of health neglect alongside contemporary challenges, in order to argue for a rights-based approach where tribal communities are empowered as holders of health-based rights instead of being at the receiving end of welfare schemes.

Among communicable diseases, malaria, tuberculosis, leprosy, vector-borne diseases feature most prominently in the tribal health literature. Ali (1994), while mapping disease prevalence regionally, identified malaria to be the most dominant communicable disease in the Northeastern tribal region, along with tuberculosis, venerable diseases, and different types of skin conditions. Negi and Azeez's (2021) work highlights high burdens of communicable disease along with high infant and maternal mortality rates and widespread anaemia among women, which reiterate the fact that the structural conditions of deforestation, and economic marginalisation are actively responsible for undermining health.

The emergence of NCDs within tribal communities further complicates the already disproportionate health burden carried by the tribals. Kapoor et al. (2010) documented incipient metabolic syndrome, which is a co-occurrence of high blood sugar, high blood pressure, and high fat percentage among the Saharia tribe of Madhya Pradesh, and pointed to the health consequences of socio-economic transition and changes in lifestyles even the most ostensibly 'primitive' tribal groups. Similarly, Mini and Moli (2005) using NFHS-II data, have recorded high usage of tobacco, alcohol consumption, and substance-related cancer risks among tribals with significant variation by gender, age, marital status and even residence. These works expose the reality of India's tribal health in the face of rapid socioeconomic changes and globalised world order.

Nutritional deficiencies constitute another key area of tribal health concern and disease burden. Singh and Sharma (2019) in their study of the Gond and Kawar children in central India, made distinct records of short stature, low body weight, vitamin deficiency diseases, as well as malnutrition and infectious diseases resulting in high infant

morbidity and mortality. In Sonowal's (2010) study of tribal children in Maharashtra, malnutrition was found to be a direct consequence of socio-economic disorganisation, rooted in the loss of land and forest resources, inadequate livelihood opportunities, low female literacy, child marriages, and narrow inter-birth intervals. The existing literature therefore supports the argument that malnutrition is not something that can be addressed through food supplementation alone but needs to be addressed through structural interventions that ensure land rights, women's education as well as livelihood security.

When it comes to health-seeking behaviours among tribal people, it is one of the most extensively studied dimensions of tribal health and yet also the most frequently mischaracterised. The dominant school of thought, as reflected in earlier scholarships, tended to reason that the low utilisation of and reliance on biomedical facilities was due to their state of 'primitivity,' a result of superstition, ignorance, and cultural isolationism and conservatism. This framing is highly problematic because it assumes a lower rational position of tribal communities in relation to non-tribals and undermines the contexts of structural exclusion and inequalities. Nuanced analyses by Swain (1994) and Sachchidananda (1994) and other subsequent scholars, have demonstrated that tribal health-seeking is shaped by the complex interplay of cosmological and ontological frameworks, economic and cultural dispositions, accessibility as well as the trustworthiness of available healthcare options.

Swain's (1994) work identified two primary categories of disease causation — supernatural and physical. Supernatural causes are further classified into eight subcategories such as soul loss, breach of taboo, sorcery, ancestral spirits, evil eye etc. Healing processes follow the logic of causation: diseases caused by supernatural factors would be treated by the shaman or medicineman through magico-religious interventions, while physically caused illness may be amenable to traditional herbal medicines, or, eventually biomedical care. In certain cases there is a hierarchy which is also observed. Those illnesses which remain resistant to biomedicine treatment are then treated through supernatural media. Whereas in some other tribal societies, both biomedicine and ethnomedicine are treated as parallel and complementary to each other, and not substitutive. These systematic etiologically ordered approaches to healing and treatment are documented across multiple tribes, including Bhattara of Odisha (Mahapatro and Kalla 2000), the Kondh (Swain, 1994), and the tribes of Bastar district (Basu et al., 1994) to name a few.

Kumar and Kumar (2022) offer a systematic analytical framework to understand this behaviour through the 'Five A' approach — availability, accessibility, affordability, acceptability, and accommodation. This demonstrates that failures across multiple dimensions simultaneously forced tribals to rely on non-formal pathways. Out of these five, acceptability becomes a particularly important dimension because cultural and linguistic barriers between tribal folk and biomedical health providers, combined with histories of documented experiences of discrimination, trivialisation, and dismissiveness create environments of institutional mistrust that makes rational actors avoid them (Deb Roy et al., 2023; Soman et al., 2024). This why the comparative analysis of Karbi and Mising health-seeking behaviour will have profound implications in the ways we understand disease causation, etiological frameworks, cultural and institutional structures underlying health outcomes, instead of trying to view these variations through the reductive lenses of 'compliance' and 'modernity.'

The literature reviewed above, despite its breadth, reveals a fundamental lacuna: it lacks community-specific comparative health data for individual tribes in Assam. National surveys rarely disaggregate data to the level of individual tribal groups forcing researchers to be reliant on on aggregated 'Scheduled Tribe' numerical statistics which obscures the nuanced, cosmological, ontological, geographical and ecological, social, and political intra-tribal heterogeneity in disease profile. The Karbi Anglong region presents distinct health challenges associated with hilly

forest terrain, while Mising communities on the floodplains of Brahmaputra face health consequences borne out of a riverine ecological dependence which cannot be addressed adequately under a uniform blanketed tribal category.

Synergistic Health Vulnerabilities

The concept of syndemics, developed by medical anthropologist Merill Singer, offers a theoretically richer alternative to conventional comorbidity frameworks for understanding the concentrated disease burden of marginalised populations. While comorbidity refers to the co-occurence of two or more health conditions in an individual or population, a syndemic exists when diseases not only co-occur, but also interact biologically or behaviourally to worsen health outcomes, and when this interaction is driven and sustained by shared social determinants (Shelke et al., 2023). The crucial difference is causal and structural: syndemics are produced by the convergence of behavioural dynamics, structural inequities and vulnerabilities, rather than being merely an epidemiological coincidence.

Shelke et al. (2023) provides a comprehensive review of syndemic formulations that are directly relevant to the present research. The concept of 'syndemogenesis,' which is the dynamic process through which syndemics emerge from the interaction of diseases with societal conditions, captures the temporal as well as causal complexity that rigid and static comorbidity models seem to miss. Their paper documents several instructive syndemic formations: the SAVA syndemic (substance abuse, violence, AIDS) in urban marginalised communities; the COVID-19 syndemic; and TB-diabetes interactions particularly in transitioning populations. What is interesting in these formations is the demonstration that outcomes in syndemic conditions consistently exceed what additive models predict. This is precisely because social determinants of health interact with existing conditions and amplify biological interactions. When it comes to tribal populations in India, this insight is instrumental because it helps in the analysis of how malnutrition compromises immune function and increases TB susceptibility; TB treatment adherence is disrupted by poverty and seasonal migration; poverty is worsened by the exorbitant costs of illness treatment and management and the overall disruption of physical functionality which reduces agricultural and economic productivity. Thus, this doesn't reflect mere comorbidities, but instead it is representative of a syndemically structured cycle of perpetuating vulnerability.

The direct applicability of syndemic theory to tribal health in India is supported by, though not yet directly tested against, several bodies of empirical evidence. The co-occurrence of communicable diseases, non-communicable diseases, malnutrition, mental health and substance abuse issues as documented in the national tribal health literature (Kumar et al., 2020; Soman et al., 2024) provides the epidemiological substrate for the syndemic analysis. However Shelke et al. (2023) explicitly acknowledge that tribal and indigenous populations in the global south remain severely underrepresented in syndemic research. Even specific ecological and structural conditions of rural tribal communities is insufficiently theorised within existing syndemic literature.

A fully constituted syndemic study requires epidemiological evidence of disease concentration within the same individuals or households alongside evidence of biological or behavioural interactions between conditions that reinforce outcomes demonstrably. Syndemic theory can also be applied more as an analytical framework and a theoretical lens to organise and interpret structural evidence of the conditions that syndemic theory predicts would lead to concentrated and interacting disease burdens. This approach aligns with an established tradition of syndemic-informed qualitative and mixed methods research, including Mendenhall's (2016) work on syndemics among Mexican immigrant women and Herring and Sattenspiel's (2007) work on structural and contextual analyses of

syndemic vulnerability among northern Aboriginals. Both of these works use syndemic theory to interpret structural and contextual evidence instead of requiring clinical co-occurring data. Therefore even in the absence of clinical evidence mapping the upstream conditions responsible for generating disease vulnerability instead of downstream disease interactions these conditions produce can become a crucial contribution.

Indigenous Healing Practices: Theory, Practice, and Comparative Perspectives

Tribal societies have developed rich pharmacopoeias and traditional medicinal practices as a result of their close ecological relationships with different environments and centuries of empirical observation and accumulated practice (Swain, 1994). Ali (1994) observed that indigenous health practices, such as those related to preventive and curative healthcare used by communities as medical therapy, have a direct relationship with the eco-system and physical environment in which tribal groups live. These accumulated experiential knowledge over generations, help produce ecologically situated and culturally integrated epistemologies. Ethnomedicine, folk medicine, traditional medicine and tribal medicine are constitutive of indigenous healing traditions (Reddy et al., 2023) but each carry its own meaning and significance within a particular context.

The ethnomedicine of tribal communities have, throughout history, been reduced to its pharmacological dimensions. As Swain (1994) documented and Sachchidananda (1994) elaborated, these indigenous healing practices are not isolated technical systems. These are complex, intricate and embedded processes situated within a broader socio-religious-cultural framework where the identification of disease causation, whether physical or supernatural, determines the therapeutic path. The local medicine or shaman becomes a mediator between the human and the supernatural world by interacting and negotiating with natural spirits, propitiating deities and ancestral spirits, in order to restore the relational balance between the living and the dead, whose disruption produced illness. This relational, cosmological and ontologically-rooted character of indigenous medicine is yet to be recognised fully and integrated into conventional biomedical frameworks because the latter operates within a nature-culture dualism that undermines and dismisses alternative local medical frameworks and separates pharmacological dimensions from spiritual efficacy.

The comparative study of Karbi and Mising ethnomedicine permits a theoretical analysis of the ontological premises of indigenous medical systems which have been treated as a cultural overlay on an otherwise universal biomedical substrate by dominant biomedical scholarship and policy frameworks. This is particularly important for comparative ethnomedicine research because it allows the researcher to trace both similarities and differences between two tribal therapeutic systems and also with biomedicine without undermining or reducing one to a variant of the other. Common plant species may be used by both communities but embedded in very different network configurations such as different preparation methods, accompanying rituals, practitioner roles, meaning and cultural value, which produces functionally distinct healing systems even if there is a pharmacobotanical overlap. Conversely, functionally similar therapeutic outcomes may be achieved through completely different plant species and rituals assembled within different assemblages. Therefore, there is a need for a suitable comparative lens that is sensitive to both convergence and divergence without imposing or inferring a hierarchy between biomedical and indigenous explanations of therapy and healing.

The northeastern region of India has attracted wide interests in ethnobotanical and ethnomedical research. But the literature recognises that ethnomedicinal documentation must pay attention to the embeddedness within which such systems of traditional healing emerge instead of reducing it all to pharmacobotanical inventory. Laldingliani et al.

(2022), Panmei et al. (2016), and Ralte et al. (2024) demonstrate that the medicinal studies of Northeast Indian tribal communities produce richer and more analytically useful findings when they situate these plants' use within the broader framework of illness classification, healer roles, as well as transmission networks that give it its cultural meaning. Kumar et al. (2021) goes on further to argue that traditional ethnobotanical knowledge, held by indigenous communities, is directly relevant to sustainable development goals such as health equity, because it connects the documentation of tribal plant knowledge to the structural health justice concerns. Dhungana et al. (2018) in one of the few comparative ethnobotanical studies to include Karbi communities along with Garo and Khasi groups in northeast India, highlight both the richness of Karbi plant knowledge, and the significant intercommunity variation in medicinal plant use, even within the same broad regional ecology.

Karbi and Mising Ethnomedicine: Cosmology, Practice, and Pharmacopoeia

The Karbi people of Karbi Anglong district possess one of the richest and most ecologically embedded ethnomedicinal traditions in Northeast India. Their traditional healing practices are rooted extensively on the hill forest biodiversity of their homeland. The foundational ethnographic study for understanding Karbi healing cosmology can be found in Dr. Indranoshree Das's (2011) "*Folk Medicine of the Karbis of Assam*," which provides the most comprehensive account of the ethnomedicinal practices available in scholarly literature. Das (2011) documents the deeply relational and cosmologically structured character of Karbi healing. Here, illness among the Karbis is not understood purely as a biological function, limited to the body of the individual alone but as a description of the proper relational order between humans and the complex of deities, spirits, and ancestral beings. It also acknowledges that various forest and nature spirits are associated with specific ecological zones that are inhabited by Karbi folks. Therefore the ethnographic data articulates that within the Karbi cosmological framework, healing is a fundamentally social and relational activity, and the restoration of health requires restoring proper relations with non-human entities. To mediate between human and non-human worlds they require the presence of a ritual healer who can perceive, diagnose and negotiate the supernatural dimensions of affliction, pain and suffering that the biomedical practitioners, who are operating with a fundamentally different ontological framework, refuse to accept.

Barua and Baruah (2021) India study of Karbi traditional ecological knowledge with an emphasis on healthcare system, record the depth and ecological embeddedness of their medicinal plant knowledge and reveal that Karbi therapeutic practice, integrates pharmacological and ritual dimensions in certain ways that makes them inseparable from their wider understanding of the hill forest ecosystem. Their study highlighted that Karbi plant knowledge is not simply a pharmacopeia but is a form of ecological epistemology in which specific plants are understood as possessing relational properties and capacities to mediate between human and supernatural realms and heal illnesses to which no biomedical cure exists. Devi et al. (2020) who focuses on the medicinal plants of sacred groves in Karbi Anglong, document 38 ethnomedicinal plants of 36 genera and belonging to 27 families, used by the Karbi tribes which make sacred ecological sites not only repositories of cultural significance and biodiversity but also of traditional healing practices and knowledge systems. Therefore, the enclosure of forests, loss of wildlife, loss of material access to their natural resources, conversion of hill forests to land for private and corporate use directly threaten Karbi ethnomedicinal and indigenous knowledge systems by disrupting the ecological and relational conditions within which those knowledge is constituted as well as transmitted.

Das et al. (2023) in their quantitative documentation of folk remedies used by Karbis of West Karbi Anglong, capture 80 medicinal plant species used for the treatment of 31 different disease categories. This provides, although not extensive, a very systematic pharmacobotanical account of Karbi plant use which is currently available. Their analysis of disease categories, use-value indices, and informant consensus factors illustrate both the scope and breadth of Karbi pharmacopoeia and patterns of socially embedded nature of Karbi ethnomedicinal knowledge. Kalita et al. (2025) in a very recent study of ethnomedicinal plants used by Karbi folks in West Karbi Anglong, provides an updated documentation of plant use including correlations between disease types and plant species which has helped in the further understanding of ethnobotanical knowledge of Karbi community. Together, these studies establish a well-documented pharmacobotanical basis.

A notable concern reflected across all the studies is the documented erosion of Karbi ethnomedicinal knowledge under a combined pressure of deforestation, restricted access to forest and hill resources, the displacement of oral transmission systems by formal education and the growing penetration of biomedical care into Karbi Anglong. Negi and Azeez (2021) identify this pattern across tribal India, while within the Karbi context Das (2011) and Barua and Baruah (2021) both observed that the transmission of healing knowledge from older to younger generations is becoming fragmented day-by-day as the ecological and social conditions that used to sustain it, are gradually falling apart. Therefore there is a cultural need to analyse and reread time-sensitive ethnographic records of knowledge systems actively under threat.

Mising people, which constitute one of the largest tribal communities of Assam, inhabit the flood-prone banks and riverine islands of the Brahmaputra and its tributaries. They possess a healing tradition that is as ecologically distinct as their river habitat. One of the primary sociological studies grounding analysis of Mising health is Tapan Saikia's (2013) thesis *A Sociological Study of Health in the Mishing Tribe of Golaghat District Assam*, which provides a foundational framework of Mising health conception, disease etiology, healing practices and health-seeking behaviour within a sociological structure. Saikia (2013) documents the deeply cultural and relational character of Mising perceptions on health. Health within this context is understood as a balance of relation between ancestral spirits and natural beings. It incorporates ideas about celestial beings, spiritual forces as old as time, ancestral spirits, organisation of the clan, elaborate rituals and practices, and social institutions that are woven together in unity and harmony that ensures the wellbeing and good health of the tribe. Instead of a biomedical perspective that views health in terms of physiological, emotional or social well being, Mising's complex and layered ideas of health is perceived as a state of equilibrium among humans, ancestors, the forces of the environment and the gods in the heavens above. What constitutes healing in this cosmologically embedded system, is the collective efforts of the people of a community. The responsibility to heal and become better doesn't rest on the individual alone. The traditional healer called *Mibu* or *Bej* assumes the role of the transcendent healer which connects the visible with the invisible world. Mising ethnomedicine therefore cannot be boiled down to a body of herbal medicines or supernatural, magico-religious rituals and practices. Instead it functions through a pluralistic etiology that identifies both physical and supernatural causes of disease and illnesses. Additionally instead of being positioned in a hierarchy of ontologies, they form layered causes of illness causation, which is itself not predetermined or fixed and is subject to interpretation and change from case to case. This allows great freedom, accessibility, and flexibility for Mising tribal people to inform their therapeutic choices.

Borah et al. (2021) in their quantitative documentation of traditionally used medicinal plants among the Mising community, provide one of the most comprehensive ethnobotanical studies of Mising plant use. They conduct their study across multiple Mising communities, and arrive at 153 plant species under 126 genera and 62 families, used

for healthcare. Their paper findings shed light on the cultural and medical value of these plants as still a large number of people rely heavily on these traditional medicines despite a parallel growth of modern healthcare systems. Mising pharmacopoeia is found to be extremely rich in species associated with febrile illness, gastrointestinal disorders, reproductive health, skin diseases, and even chronic diseases like diabetes, hypertension, liver disease and others. Additionally diseases relevant to Brahmaputra valley's epidemiological profile of waterborne illnesses, vector borne diseases, jaundice and infections and other nutritional diseases related to floods and food insecurity.

The comparative ethnomedicine and tribal healing practices of Karbi and Mising tribes reveals a pattern that is theoretically productive because it combines ecological contrast with structural similarity. At the level of ecological setting the two communities live in fundamentally different environments— Karbis in the forested hills and Misings in the floodplains of the Brahmaputra valley. This ecological difference is also reflected in pharmacopeias and their specific species assemblages, the mode of preparation, as well as administration. Dhungana et al. (2018) argue that even among geographically proximate Northeast Indian tribal communities, medicinal plants can vary significantly reflecting that local ecological knowledge and ontologies are differently shaped, developed and lived. This finding caution against assuming that all northeastern tribes can be understood under a common membership in the category of 'Scheduled Tribes.' Since they differ in their ontological origins, ecological settings, pharmacopeias and ritual practices, they cannot be subsumed under such collectives and need separate attention and consideration of their respective cultures, disease burdens, and health profiles which the current policy framework is not equipped for.

The larger and deeper argument revolves around the politics of these ethnomedicinal knowledge systems. Who owns it, who may transmit it, how it is protected from appropriation, who benefits from selling it, or patenting it are questions that still haven't received adequate attention. Cordes et al. (2024) by applying indigenous data sovereignty principles to health knowledge reiterate that research involving traditional knowledge systems must be conducted through genuine partnerships with communities that maintain co-ownership of the resulting documentation. The threat of biopiracy, the extraction of ethnopharmacological knowledge for commercial pharmaceutical development without benefit to source communities is an additional political dimension of tribal healing practices that researchers have an ethical obligation to address in their methodologies.

Scope For Future Research:

The existing literature, thus, reveal both a substantial body of knowledge of tribal health in India and a set of persistent interconnected, empirical and theoretical gaps. Community-specific comparative research, grounding health analysis within the distinct, socio-ecological and ontological contexts of particular tribes remains scarce and tribes from the Northeast, such as Karbi and Mising are conspicuously absent from this literature. The syndemic framework offers a theoretically sophisticated approach to understanding how multiple health conditions interact synergistically among tribal populations and worsen their disease burden. But again the application of this framework to tribal communities in the global South, specifically to communities in Northeast India, is almost entirely absent from the existing literature (Shelke et al., 2023). The analysis of differential vulnerability, by taking help of existing literature and statistics to examine synergistic interactions among communicable diseases, non-communicable diseases, malnutrition, substance abuse, and mental health conditions within the specific structural contexts of Karbi and Mising tribes is needed. Very few studies have engaged adequately with the questions of knowledge politics, and indigenous data sovereignty that must frame any responsible ethnomedicine research. There is a need for future studies to address these gaps through a community-embedded, comparative mixed-methods, study of Karbi and Mising health in Assam, in order to make crucial contributions at the intersection of tribal public health, medical anthropology, sociology of public health and indigenous health studies.

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