

Cultural Sovereignty at the Margins: Indigenous Knowledge Systems in the Geo-Political Context of Arunachal Pradesh

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Abstract

The paper explores the role of Indigenous Knowledge Systems (IKS) in the surrounding communities of Arunachal Pradesh, India, in expressing cultural sovereignty and its capacity to operate in the wider geopolitical context. Arunachal Pradesh, with its north eastern frontier with India, and sharing a lengthy international position with China, Bhutan, and Myanmar, is a very sensitive area that is characterized by a collision of culture, identity, and security. In this context, native healing practices, ecological literacy and spirituality are not just local sources of health, but are also strong identifiers of cultural identity, survival, and political presence. It is centuries of experience involving these knowledge systems with brittle Himalayan ecologies that provide comprehensive ways of approaching wellbeing that consider physical, spiritual, and environmental aspects of health.

Based on ethnobotanical literature, anthropological literature and policy-focused literature, the research focuses on three related aspects, namely how the indigenous systems of healing contribute to the community wellbeing and strengthening intergenerational transmission of knowledge, how vulnerable these systems are to acculturation, religious conversion, modernization, and governance issues, and what the study implications have on state strategy, cultural sovereignty, and social cohesion in borderland areas. The qualitative synthesis approach adopted in the paper will examine the role of indigenous epistemologies in advancing local resilience and a sense of belonging and continuity in geopolitically disputed spaces.

The study posits indigenous knowledge to be a type of cultural capital and soft power by placing IKS in a geopolitical context, which enhances the stability of the borderlands. It points out that the protection of these systems is not just a question of cultural protection or healthcare sustainability, but also a strategic need to have inclusive governance and national integration. The paper ends by reiterating that there is an absolute necessity of an integrated and culturally sensitive policy frameworks that safeguard indigenous epistemologies, safeguard community participation, and bring the alignment of local knowledge with the overall development and security agenda, which enhances regional stability without undermining indigenous autonomy.

Keywords: Arunachal Pradesh, Borderland Communities, Community Resilience, Cultural Sovereignty, Geopolitics, Indigenous Knowledge Systems, Traditional Healing Practices

Introduction

The Indigenous Knowledge Systems (IKS) are multifaceted, all-encompassing worldviews that have been formed in the course of long-term interplay between human society and nature, as well as social and spiritual worlds. Such systems include health, ecological, agricultural, spiritual, governance, and livelihood knowledge that are mostly passed on by oral traditions, rituals, and experience, and across generations (Berkes, 2012). In comparison to codified modern scientific knowledge, IKS is situational, adaptive and intertwined with cultural values and the collective memory. Over the past few decades, it became more common among scholars to view indigenous knowledge as a dynamic system of epistemology, with considerable relevance to sustainability, wellbeing and resiliency (Agrawal, 1995; UNESCO, 2017).

The northeastern frontier state of India Arunachal Pradesh gives a good example to study Indigenous Knowledge Systems. The population in the region is well endowed with vast ethnolinguistic and cultural diversity with diverse tribal societies holding their unique traditions. The tribal population of the state inhabits about fifty languages and dialects of different subgroups of the Tibeto-Burmans and educational sources indicate that there are about 26 major tribal groups with numerous sub-tribes and the cultural and social heterogeneity is high (E-GyanKosh, 2025; Encyclopedia Britannica, 2025). With rugged mountainous topography, thick forests and biodiversity, the Eastern Himalayan biodiversity hot spot of Arunachal Pradesh has traditionally been geographically remote to mainstream infrastructural development. This remoteness has restricted the extent of formal healthcare systems particularly in the interior and border districts rendering indigenous healthcare practices a major source of healthcare to most communities (Kala, 2005; Tangjang et al., 2011).

In Arunachal Pradesh, traditional healers fulfill diagnostic, ritual, and custodial functions, i.e., a combination of plant-based treatment with spiritual and social practices, thus, becoming both healthcare providers and cultural memory and ecological knowledge guardians (Tangjang et al., 2011; Namsa, Mandal, Tangjang, and Mandal, 2011; Shankar et al., 2012; Bushi et al., 2021). Ethnobotanical research among tribes like the Nyishi, Adi, Apatani, Monpa and Nocte has reported the wide use of medicinal plants in the treatment of conditions that include gastrointestinal diseases and respiratory infections among others as well as psychosomatic diseases (Kala, 2006; Tangjang and Arunachalam, 2009). The practices are characterized by a holistic concept of health that considers illness as the lack of harmony among human, nature and spiritual world.

In addition to their contribution to health and wellbeing, Indigenous Knowledge Systems are also critical in establishing cultural identity and cultural sovereignty. Cultural sovereignty is the cultural right of indigenous people to safeguard, practice and pass on their cultural knowledge, values and institutions without any outside dictation or denial (Niezen, 2003). In the case of indigenous people, knowledge cannot be separated with identity; when traditional knowledge is being eroded, cultural degradation and loss of independence may appear (Smith, 2012). In Arunachal Pradesh, where tribal identity is strongly connected to land, ecology and ancestral practices, indigenous healing practices serve as vital manifestations of self-determination and continuity.

Cultural sovereignty is further enhanced in border areas that are characterized by geopolitical sensitivities. The Arunachal Pradesh has a long and disputed international boundaries with China, and borders with Bhutan and Myanmar. These borderlands are not only strategic spaces but inhabited spaces in which local communities are the initial custodians of cultural and social space of the nation (van Schendel, 2005). Indigenous knowledge and cultural practice play a role in social cohesion, place-based identity and resistance to outside forces, in such situations. According to scholars of border studies, a robust sense of local identities and rootedness to cultural values promote stability in the frontier regions by creating the sense of belonging and stake holding among local people (Donnan and Wilson, 2010).

Although they are important, Indigenous Knowledge Systems in Arunachal Pradesh are increasingly becoming threatened. Traditional ways of passing knowledge have been perturbed by processes of modernization, formal education systems that marginalize indigenous forms of epistemology, religious conversion, market-driven development, and urban migration (Kothari et al., 2014). Youths tend to feel that the indigenous practices are old or do not align with the current generation and there is progressive loss of intergenerational knowledge transfer. Also, the traditional knowledge lacks formal recognition and legal protection in the policy frameworks, which makes such systems prone to negligence, misappropriation and loss (Agrawal & Gibson, 1999).

The issue of governance also makes IKS survival complicated. Although national projects like the Traditional Knowledge Digital Library (TKDL) are expected to preserve indigenous medicinal knowledge, these projects are frequently focused on codifying this knowledge instead of community ownership, which has led to ethical issues concerning intellectual property and sharing of benefits (Dutfield, 2003). Policy interventions in Arunachal Pradesh are still disjointed with little incorporation of indigenous healing systems in the public health planning or education programs. Such disconnect on policy discussion and the realities of the communities negates cultural continuity and comprehensive development.

When one considers the Indigenous Knowledge Systems through the perspective of geopolitics, he/she can see the bigger strategic picture. Cultural erosion may reduce social solidarity and intensify a sense of marginalization in borderland areas such as Arunachal Pradesh, and the acknowledgement and establishment of indigenous institutions may also build stronger trust between the state and the community. According to the claims of scholars, culture and knowledge act as sources of so-called soft power that influence the sense of legitimacy and belonging in a disputable space (Nye, 2004). Therefore, the protection of IKS is not merely a question of cultural ethics or health sustainability, but also, a mandatory element of the borderland governance and the integration of the nation.

It is against this background that the current paper puts Indigenous Knowledge Systems, especially traditional healing practices, into perspective in the geo-political realities of Arunachal Pradesh. The study attempts to leave the descriptive explanations of ethnomedicine and to move to a more integrative view of the relationship between knowledge, sovereignty and borderland resilience by placing indigenous epistemologies at the nexus of culture, health and geopolitics. By so doing, the paper holds that documenting, protecting and institutionally supporting Indigenous Knowledge Systems is essential to the

wellbeing of tribal communities as well as enhancing cultural sovereignty and regional stability within one of the most strategically important frontier regions in India.

Review of Literature

Indigenous Healing Practices in Arunachal Pradesh

The prevalence of indigenous healing practices among tribal communities of Arunachal Pradesh has been well documented by extensive scholarship, highlighting their importance as the primary healthcare systems in remote and ecologically sensitive areas. Ethnobotanical knowledge, ritual practices and community-based healing traditions that are passed orally across generations are deeply embedded in traditional medicine in the state. The Nocte tribe studies indicate that the Nocte tribe makes use of more than thirty species of medicinal plants in the treatment of common health conditions including fever, gastrointestinal diseases, wounds, and respiratory diseases, which is evidence of advanced ecological practices and sound resource utilization (Tangjang et al., 2011). The practices focus not only on the therapeutic efficacy but also the cultural embeddedness of the knowledge about healing in everyday life.

Equally, a study of the Nyishi tribe in Kurung Kumey and Kra Daadi districts shows a syncretic healing system, which integrates herbal treatments with magico-religious practices, such as incantations, divination, and propitiation of ancestors (Chokio, 2018). In this world outlook, illness can be interpreted as a disruption in the harmony between human beings, the natural environment and the spiritual world, which needs holistic intervention and not necessarily biomedical therapy. This kind of finding echoes with more general anthropological conceptualizations of indigenous medicine as holistic systems that connect physical health with moral, social, and cosmological aspects (Berkes, 2012).

The ethnomedicinal practices of the Adi communities in the Upper Siang district also helps in showing how indigenous systems of healing serve as stores of both biological as well as cultural information. Medical practitioners, ecological stewards, and guardians of oral traditions, community healers are often elders or specialists in rituals (Ramya & John, 2021). Their expertise in medicinal plants is directly associated with seasonal rhythms, forest ecology, and traditional legislations of resource utilization, which shows the irrelevance of health knowledge and environmental ethics.

The impressive diversity and specificity of plant-based therapies applied to a broad array of ailments is supported by broader ethnobotanical surveys that have been made among many tribes in Arunachal Pradesh (Kala, 2005; Kala, 2006). These studies place the indigenous healing practices in the eastern Himalayan biodiversity hot spot, where there is a focus on the co-evolution of cultural practices and ecological adaptation. Together, this literature corpus makes indigenous healing systems dynamic, culturally appropriate and context-specific systems of knowledge that remain essential to the health of a community.

Cultural Sovereignty and Identity

In addition to their use in the healthcare sector, Indigenous Knowledge Systems are now being identified as the basis of cultural identity and sovereignty. According to indigenous epistemology scholars, traditional knowledge is not just instrumental but highly symbolic in nature and reflects values, cosmologies and shared memories, which shape communal worldviews (Smith, 2012). The transmission of knowledge

via rituals, healing methods, and narration strengthens the social cohesion and the continuity between generations, and IKS is a vibrant means of cultural sovereignty.

Loss of indigenous knowledge systems, thus, is not only a loss of information that is useful, but an imminent danger to cultural existence. Niezen (2003) points out that cultural sovereignty is closely connected to the right of indigenous people to keep their systems of knowledge and their ways of living under their control. In the case of Arunachal Pradesh, where the tribal identities are strongly defined by land, forests, and ancestral practices, indigenous healing practices are the key indicators of self-determination and opposition to cultural homogenization.

Indigenous knowledge is a concept that has undergone more scrutiny in Indian scholarly literature, in the context of intellectual property rights, cultural resilience and postcolonial governance. Theorists have pointed out how indigenous epistemologies have been marginalized by globalization processes, market pressures, and state-centric conceptions of development, and are hence susceptible to either appropriation or marginalization (Agrawal and Gibson, 1999; Kothari et al., 2014). Simultaneously, it is increasingly becoming recognized that the protection of IKS is the key to the preservation of cultural diversity and the epistemic justice in the pluralistic societies.

Preservation and Policy Problems

Although there is increasing academic awareness, preservation of Indigenous Knowledge Systems has a lot of policy and institutional hurdles. In isolated parts of the Himalayan states such as Arunachal Pradesh, government stakeholders have been putting more stress on the necessity of combining local medicinal knowledge with mainstream healthcare systems to enhance access and communal confidence (Kala & Ratajc, 2012). Both state and national policy narratives recognize that traditional systems of healing can be used as a complement to biomedical systems especially in regions where formal healthcare systems are still inadequate.

Nonetheless, the policy discourse is not translated into action in a balanced way. Documentation, scientific validation, and legal safeguarding of indigenous knowledge are underdeveloped and usually have no community involvement and ethical protection (Dutfield, 2003). Efforts like the Traditional Knowledge Digital Library (TKDL) have been reported to favor codification over culture and community control; which has brought up the issue of intellectual property rights and benefit-sharing (Agrawal, 2002).

Besides very little documentation, the mode of apprenticeship and oral transmission is also being eroded by the rapid socio-cultural changes caused by formal schooling, modernization and lifestyle shifts, which have resulted in the erosion of tribal knowledge and cultural identity (Pulu & Meena, 2025; Cysil and Wilson, 2025; Blench, 2024). Such issues highlight the necessity of culturally aware policy frameworks that are able to balance between preservation, validation, and community autonomy.

Research Gap and Rationale

Although Indigenous Knowledge Systems form the core of the tribal identity and community health, the IKS has not been theorized adequately in the mainstream research as a component of geopolitical resilience and cultural assertion. Cultural cohesion is not a peripheral issue but a strategic resource in

Arunachal Pradesh where interplay of international border pressures, infrastructural constraints and development issues collide. Borderland studies are becoming more aware of the fact that the frontier regions of the country can only be held together through stable and resilient communities (Donnan and Wilson, 2010; van Schendel, 2005).

This gap is addressed in this paper, which views indigenous healing practices as cultural and medical systems, as well as geo-political resources that help to maintain borderland stability and cultural sovereignty. The study will take a multidimensional approach to IKS beyond descriptive ethnography by incorporating insights into indigenous studies, anthropology, and border studies. It aims to show that protecting indigenous healing knowledge is essential in increasing community resilience, improving the levels of trust between the state and indigenous communities, and solidifying cultural sovereignty in geopolitically vulnerable areas. It is through this analytical lens that the study has placed Indigenous Knowledge Systems as part of inclusive governance and sustainable development policies in Arunachal Pradesh, which can be of relevance to policy makers, scholars, and community stakeholders in general.

Research Questions

1. What does the current literature conceptualize indigenous healing practices as cultural identity and sovereignty amongst border communities in Arunachal Pradesh?
2. How does the literature associate Indigenous Knowledge Systems with geopolitical resilience and borderland stability in Arunachal Pradesh?
3. Which policy strategies and institutional models have been suggested or put into practice in protecting and integrating Indigenous Knowledge Systems and what are the constraints in the literature?

Research Objectives

1. To critically analyze the available literature on indigenous healing practices in Arunachal Pradesh and discuss their cultural and social values.
2. To examine academic and policy discourses placing Indigenous Knowledge Systems in a geopolitical and borderland setting.
3. To generalize on interdisciplinary literature knowledge to determine gaps, challenges and opportunities towards protecting Indigenous Knowledge Systems.
4. To come up with conceptually informed policy, research, and governance recommendations on the available evidence.

Methodology

This paper has a qualitative, interpretive literature review approach, and it has used secondary sources. The methodology will critically analyse the ways in which Indigenous Knowledge Systems are and have been discussed in academic, policy, and institutional literature especially the indigenous healing practices, and how these discussions relate to the cultural sovereignty and geopolitics themes.

Research Design

The study adheres to the narrative-thematic literature review research design that allows understanding complex and interdisciplinary notions like Indigenous Knowledge Systems, cultural sovereignty, and borderland geopolitics in-depth and contextual. Instead of summarizing empirical evidence, this methodology focuses on conceptual explanation, comparison and synthesis of different literature bodies.

Sources of Data

The following types of secondary sources are used in the study:

1. Peer-reviewed journal articles on the subject of indigenous healing practices, ethnomedicine, and traditional knowledge systems in Arunachal Pradesh and the Eastern Himalayan region in general.
2. Academic books and edited volumes on indigenous epistemologies, cultural sovereignty, border studies and geopolitics.
3. Report documents and government policy as well as material concerning traditional knowledge, healthcare integration and tribal affairs.
4. Credible media reports and institutional publications touching on indigenous knowledge preservation and policy discussion in Arunachal Pradesh.
5. Academic databases (Scopus, Web of science, JSTOR, Google Scholar and official government portals) were used to identify sources.

Literature Selection Criteria

The selection of literature was done on the following basis:

1. Applicability to Indigenous Knowledge Systems, traditional healing, or cultural practice in Arunachal Pradesh or other similar borderland locations.
2. Academic integrity, such as peer-review, frequency of citation, and institutional authorship.
3. Thematic topicality of cultural sovereignty, identity, governance, and geopolitics.
4. Published in English no earlier than 2000, preferably recent policy-focused and interdisciplinary research.

Analytical Approach

The chosen literature was analyzed through thematic analysis, i.e. method of systematic search of repetitive ideas, arguments, and stories based on the sources (Braun and Clarke, 2006). The major themes of analysis were:

1. Cultural practice that is indigenous healing.
2. Intergenerational continuity and knowledge transmission.
3. Sovereignty and identity: Cultural.
4. Policy recognition and institutional gaps.
5. Geopolitical usefulness of borderland knowledge systems.

Moreover, the conceptual synthesis methodology was used in order to combine the viewpoints of anthropology, indigenous studies, public health, and border studies, which allowed developing a multidimensional interpretation of the Indigenous Knowledge Systems.

Discussion

Indigenous Healing Practices as Expressions of Cultural Sovereignty

The Arunachal Pradesh exemplifies indigenous healing in the form of herbal pharmacopoeia, rituals-based and spiritual interventions, which are highly embodied epistemologies that have been developed over time through the interaction between that area and its ecologies and ancestral belief systems. These practices are not just the therapeutic reactions to the sickness but the culturally engrained systems, according to which communities perceive health, disease and the ethical arrangement of life. The ethnobotanical research of the Nocte, Nyishi, Adi, Apatani, and Monpa tribes always attests to the impossibility of plant-based treatments outside of ritual procedures, taboos, and moral standards of human-nature relations (Tangjang et al., 2011; Kala, 2005).

These epistemic traditions can be considered as a tool of cultural sovereignty because it allows indigenous communities to maintain control over the ways in which knowledge is produced, passed, and applied in the socio-cultural contexts. Scholars believe that in indigenous terms, sovereignty is more than the political aspect to epistemic self-determination which is the power to determine its own structures of knowing and being (Smith, 2012). The Arunachal Pradesh has indigenous forms of healing which influence the social understanding of health and illness as a relational state influenced by ecological harmony, spirit of the ancestors and social peace. This paradigm opposes the reductionist biomedical paradigm and claims a different epistemology based on indigenous cosmology.

In addition, the fact that traditional healers are the holders of medicinal knowledge strengthens the unity of the community and inter-generational continuity. Knowledge is passed on via practices of apprenticeship, taking part in rituals and oral tales, and entrenches a healing practice within larger cultural structures. The loss of these practices, consequently, does not just pose a risk to healthcare access, but also the cultural and self-rule of the indigenous people (Niezen, 2003). The literature therefore places the indigenous systems of healing very clearly as central to cultural sovereignty and not as marginal cultural artifacts.

Borderland Geopolitics and Indigenous Knowledge Systems

Arunachal Pradesh is a geopolitically sensitive, frontier state, with a long and disputed international boundary with China, and borders with Bhutan and Myanmar. According to borderland scholarship, these are not only strategic areas but also socially inhabited areas where local communities are very vital in maintaining national presence and legitimacy (van Schendel, 2005; Donnan and Wilson, 2010). In this context, Indigenous Knowledge Systems can be said to act as contributors to what can be described as cultural and social resilience, and strengthen local sense of place, identity and state.

It is proposed by the literature that good cultural identities based on indigenous knowledge lead to the promotion of social cohesion and minimization of the sense of marginalization in border areas (Baruah, 2003). Indigenous healing as a lifelong practice can make people feel rooted and belonging which enhances the community agency. This cultural embeddedness is a kind of soft power which supplements the military and infrastructural interventions of border security (Nye, 2004). As much as roads, defense installations, and surveillance are famously part of state policies, the cultural aspects of resilience, including language, rituals, and healing systems, have not been identified as such despite their stabilizing effect.

Moreover, marginalization or erosion of the Indigenous Knowledge Systems may increase alienation, especially among the youth, which may undermine community-state relations. Experts warn that failure to consider the cultural dimensions in governing borders may jeopardize the stability in the long run (Donnan and Wilson, 2010). In comparison, the acknowledgement and the institutional reinforcement of indigenous practices indicate respect towards local identities and strengthen trust and collaboration. Therefore, the maintenance of IKS in Arunachal Pradesh not only has cultural conservation implications but also geopolitical stability implications and inclusive government.

Knowledge Erosion, Modernity, and Sustainability Problems

In spite of their universal applicability, Indigenous Knowledge Systems in Arunachal Pradesh have a lot of sustainability problems. Urban migration and changes in socio-cultural patterns have broken the traditional patterns of knowledge transmission due to formal education systems that emphasize mainstream curricula. The younger generations are becoming less and less connected with the native languages and cultures, which contributes to a loss of connection to the knowledge of the ancestors, and thus, erosion of native knowledge in tribal communities (Blench, 2024; Pulu and Meena, 2025).

This landscape is further complicated by religious conversion and acculturative forces. According to a number of studies, the change in belief systems can undermine the cosmological premises under which indigenous healing practices are based, specifically those ones that involve ritual mediation between humans and the spiritual realm (Kothari et al., 2014). Due to the decrease in ritual practices, the contextual knowledge needed to use ethnomedicinal remedies in the right context is also lost, thus leading to the partial or total disappearance of traditional healing systems.

Also, there is a danger of the ecological degradation and limited access to the forest resources to the material basis of indigenous medicine. Forests provide many medicinal plants that are regulated by customary laws; nevertheless, there are changes in land-use patterns and conservation regimes that do not involve the indigenous people and thus restrict access to the resources (Berkes, 2012). It has been noted in the literature that there is a paradox in that conservation efforts to protect biodiversity may lead to destruction of the same communities whose knowledge has traditionally led to ecological balance.

These struggles highlight why sustainable knowledge preservation solutions that extend beyond documentation are so urgently needed to achieve social, cultural and ecological aspects. In the absence of these holistic practices, Indigenous Knowledge Systems will become a collection of static archives as opposed to dynamic and adaptive traditions.

Indigenous and Modern Healthcare Policy Discourse on Integration

The discussion of policy in India has taken on a new dimension where indigenous healing systems are being considered in tandem with modern healthcare especially in rural and underserved areas. Researchers and policy makers state that the healthcare models that are culturally sensitive enhance accessibility, trust, and health outcomes among indigenous people (WHO, 2013; Kala and Ratajc, 2012). In Arunachal Pradesh, government officials have made public utterances promoting the acceptance of

traditional healing practices, which is an indication of increased appreciation of the value of traditional healing.

Nevertheless, the literature shows that there are major gaps between policy purpose and execution. Integration activities usually focus on scientific validation and standardization, which though essential, run the risk of depriving the indigenous practices of the cultural context (Agrawal, 2002). Besides, poor legal systems to safeguard intellectual property rights and benefit-sharing present indigenous knowledge to misuse (Dutfield, 2003). Researchers warn that integration must not be equated to assimilation whereby the indigenous systems are absorbed in the biomedical paradigms without regard to the epistemic autonomy.

Community involvement becomes an important ingredient towards effective integration. Research highlights the need to engage indigenous healers and elders in the process of developing documentation, validation and transmission programs to promote cultural integrity and ethical governance (Smith, 2012). The literature is therefore recommending participatory, pluralistic medical approaches that accept indigenous healing as not a substitute to modern medicine, but as complementary.

Indigenous Knowledge as Cultural and Geopolitical Capital

Integrating this information into the literature review, this discussion demonstrates that Indigenous Knowledge Systems, specifically healing practices, serve both as cultural heritage and as healthcare resources, as well as geopolitical resources. Their maintenance builds cultural sovereignty, resilience within communities, and leads to borderland stability. By placing the practice of indigenous healing within a geopolitical context, the proposed study contributes to an integrated approach that acknowledges knowledge as a type of cultural capital that has strategic implications. Preservation and restoration of IKS in Arunachal Pradesh is therefore not only an ethical concern about the indigenous populations, but a practical approach to inclusive development and local security.

Recommendations for Stakeholders

The above discussion shows that Indigenous Knowledge Systems, especially indigenous healing systems are not only cultural resources but also strategic assets in geopolitically sensitive borderland situations like Arunachal Pradesh. Protecting these systems thus demands multi-stakeholder interventions that are coordinated and respectful of cultural sovereignty and allow sustainability, ethical integration, and institutional recognition. Based on the synthesis of the existing scholarship and policy discourse, the following recommendations can be identified.

Recommendations for Policymakers

State and national policymakers should appreciate the Indigenous Knowledge Systems as part of the cultural heritage, community resilience, and inclusive development. Legal frameworks ought to be enhanced in order to formally acknowledge IKS as collective intellectual property by tapping into the existing national and international mechanisms like the Biological Diversity Act (2002), the Protection of Plant Varieties and Farmers' Rights Act (2001), and principles expressed in the UN Declaration on the Rights of Indigenous Peoples (UNDRIP).

These frameworks must provide community ownership, prior informed consent and fair benefit-sharing so that misappropriation or commodification of indigenous healing knowledge can be avoided (Dutfield, 2004). Notably, legal acknowledgment needs to go beyond the symbolic recognition to establish enforceable protections that will acknowledge indigenous communities as rights-bearing knowledge holders.

Systematic documentation efforts should also be institutionalized by the policymakers via the state universities, tribal research institutes and cultural academies especially in Arunachal Pradesh where many of the knowledge holders are old and the knowledge transfer is on the decrease. Such initiatives must embrace participatory modes whereby the healers, elders, and representatives of the community are included in determining what is to be recorded, how it is archived, and to whom it is to be availed (Agrawal, 2002). The documentation must be seen as a conservation method and not as an extraction process so that the knowledge will not be lost as it is still in its cultural and ethical context.

Recommendations for Community Leader and Indigenous Institution

Community leaders, village councils, and customary institutions are very important in preserving the Indigenous Knowledge Systems at grassroots level. Enhancement of community-based archives, learning spaces, and cultural centers can offer institutional opportunities to the elders and traditional healers to pass knowledge to the younger generations in culturally resonant ways. These areas may serve as learning classrooms where curing practices, understanding of medicinal plants, and ritual knowledge may be learned by observing and practicing, and not by being taught.

It is especially important to encourage intergenerational discussion and learning through experience in order to address the rising detachment of the younger generation to indigenous practices. Pride in cultural heritage can be encouraged through seasonal healing camps, walks in the forest, storytelling events and ritual observances, and help establish the relevance of native knowledge in modern life. Studies indicate that these communities based programs are better than external imposed programs in maintaining knowledge transmission as well as cultural continuity (Berkes, 2012).

The community leaders must also work proactively with the state institutions in order to make sure that the process of integration does not impinge the cultural autonomy. Partnering with the aim of negotiating equal terms may contribute to protecting cultural sovereignty and creating the possibility to be recognized and supported.

Recommendations for Academic and Researcher

Scholars and researchers are urgently in need of shifting towards more ethical and collaborative formulations of research and beyond descriptive ethnographies. Further studies in this area should focus on field based ethnographic research to investigate how indigenous healing activities are evolving under the current pressures of border militarization, development intervention, and social-cultural transformation. These studies can enhance the appreciation of how geopolitical realities influence indigenous epistemologies and the opposite is also true.

As a methodology, researchers ought to embrace the co-production strategies, in collaboration with the tribal healers and the institutions of the community so as to produce knowledge that acknowledges the indigenous

epistemic authority (Smith, 2012). This involves acknowledging indigenous practitioners as co-authors, co-researchers or experts as opposed to being informants. The procedures of ethical research should be transparent, reciprocal, and long-term interactions with communities.

Interdisciplinary studies that combine the fields of anthropology, public health, political geography, and border studies can further explain the strategic importance of Indigenous Knowledge Systems in frontier areas. This type of scholarship can shape evidence-based policy, as well as provoke the prevailing discourse, which tends to marginalize indigenous epistemologies.

Recommendations for Healthcare Practitioners and Institutions

Healthcare providers in Arunachal Pradesh and other such areas are advised to come up with culturally sensitive healthcare models that recognize the validity and effectiveness of the cultural healing practices. Instead of assuming that traditional medicine is inferior or even complementary, pluralistic healthcare systems may acknowledge the indigenous practices as complementary sources of knowledge which improve community trust and access to healthcare (WHO, 2013).

Doctor, nurse and frontline health worker training should have orientation on indigenous health beliefs and practices so that they can relate respectfully with the local communities. In some cases, joint referral systems between primary healthcare centers and traditional healers can enhance the quality of health and maintain cultural integrity.

These integrative strategies should be well-crafted to prevent the cultural watering down or exploitation. Any healthcare integration strategy should be based on respect to indigenous autonomy and epistemological plurality.

Conclusion

The Indigenous Knowledge Systems of Arunachal Pradesh is a symbol of cultural sovereignty in the periphery of the state authority and geopolitical conflict. Contrary to the belief that they are remnants of the past, these living knowledge systems are keeping community health status maintained, strengthening the sense of community and helping to build social and political resilience in one of the most strategically important border areas in India. The example of indigenous healing practices in particular demonstrates the interconnectedness of health, culture, ecology and spirituality in holistic epistemologies that disrupt the mainstream biomedical and developmental paradigms.

This paper has maintained that Indigenous Knowledge Systems should not be seen as cultural heritage, or alternative healthcare tools only but also as cultural and geopolitical capital. In borderland situations such as the Arunachal Pradesh, where issues of belonging, legitimacy, and resilience are closely connected with the issues of national security, the continuation of indigenous epistemologies is strategically important. The cultural erosion in these areas can also threaten the social cohesion and recognition and institutional support of indigenous practices can enhance the trust between communities and the state.

Through a literature synthesis in the field of indigenous studies, anthropology, and border studies, it becomes evident that a gap in the literature and policy has existed, namely the lack of theorizing the Indigenous Knowledge Systems as a factor in geopolitical resilience. To fill this gap, a paradigm shift is

necessary which goes beyond the tokenistic approach to recognition to participatory, rights-based and culturally specific frameworks of preservation and integration.

With India still grappling with the thorny border politics and developmental issues in its northeastern border, the protection of Indigenous Knowledge Systems must be considered a part of inclusive governance and sustainable development. The fusion of indigenous healing methods and contemporary healthcare and policy without undermining the cultural core is a way of reinforcing the wellbeing of the community and stability of the region. After all, the preservation of the living knowledge of the tribal communities of Arunachal Pradesh is not only the moral and cultural necessity, but also the strategic investment in the stability and unity of the borders of the country.

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