



Traditional medicinal knowledge of the forest dwellers: a case study from Ripu reserve forest, B.T.C. Assam

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Abstract

The use of Traditional Medicinal Knowledge (TMK) for health care is an age long tradition. Communities living in the forested tracts of Bhutan Himalayan foothills has rich traditional medicinal knowledge. However, there is a significant decline in intergenerational transfer of traditional medicinal knowledge among the indigenous communities. The present study aims to examine the prevalence of traditional medicinal knowledge among the forest dwellers of Ripu Reserve Forest, an integral part of Bhutan Himalayan Foothill of B.T.C, Assam. A comprehensive method of surveying, direct observations and focus group discussions were adopted to collect data from 450 households including all five communities- Bodo, Rahba, Santhal, Urang and Nepalese from January to June, 2013. The data collected were mostly categorical (Yes/No format), so simple bivariate method by converting into percentages were performed using Excel spreadsheet. The study reveals that the Bodos (41.87%), the early settlers of this area far exceed others communities with regard to knowledge on TMK. The study further reveals that household headed by younger ages (less than 40) reveals lesser dependence on traditional medicines. Knowledge about applications of TMK for cures extends only up to emergency time. This signifies the decline and lack of in-depth knowledge about the use of TMK. This study highlights that a proper documentations and preservations of TMK using audio-visual aid and print media is the urgent need of the time. There is a need for creating awareness and training about the importance and use of TMK by community leaders, medicinal practitioners in collaboration with modern sciences. Besides this, the loss of biodiversity, the store house of medicinal plants, needs to be addressed particularly through granting higher conservation strategies like converting some specific endemic areas into Biospheric Reserves or National Parks.

Keywords: Traditional medicinal knowledge, Forest dwellers, Loss of Biodiversity

1. Introduction

Medicinal plants are of immense significance for the healthcare needs of people worldwide (Asigbaase et al., 2014). It is estimated that between 50,000 to 80,000 of the world's plant species serve as primary sources of medicine for about 80 % of the world's population (Wodah, et al., 2012; Cakpo et al., 2017; Nguyen, et al., 2019; Dapar, M.L.G., 2020). According to the World Health Organization (WHO), more than 3.5 billion people in the developing world rely on medicinal plants for their primary health (Assefa, A., 2014; Khanum,

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H., et al., 2022). Besides their healing abilities, medicinal plants are export commodities and alternate sources of income for indigenous people in developing countries (Wodah, et al., 2012; Nguyen, et al., 2019; Assefa, A., 2014; Abebe, B.A., and Teferi, S.C., 2021).

The Forest tracts of the Eastern Himalayan foothill is an integral part of one of the globally recognized 34 biodiversity hotspots. This region exhibits a unique geographical entity, a transition zone between a mountain environment and a plain. It also marks the frontier of collision between the monsoonal and mountain systems associated with intense thunderstorms and lightning (Sharma et al., 2009). Given with distinct topography, diverse climate and habitat conditions, the region witnesses overwhelming richness, representativeness and uniqueness of biodiversity elements (Rawal et al. 2013). The region hosts remarkable plant diversity, some of which are endemic to the region (Rana et al., 2019). Ahmad et al. (2025) further asserted that Eastern Himalaya (including Bhutan and Arunachal Himalayas) harbours roughly three times more species (5452) than the Northwestern Himalaya (e.g., Jammu and Kashmir). Besides that, due to its most humid and dense forests, this region, especially the *terai* are also highly endemic with prevalence of vector borne diseases like malaria (Dutta, et al., 2011).

Numerous indigenous communities living in this forested foothill tracks of Indo-Bhutan boarder have developed diverse forms of knowledge, which are deeply rooted in their relationship with the environment and cultural cohesion and have allowed them to maintain a sustainable use and management of natural resources, protect their environment and strengthen their resilience, whilst facing new and complex circumstances (Magni, 2017). They invariably depend on diverse bioresources to meet their basic sustenance needs notably food, fodder, fuel, healthcare, etc. Among other bioresources with direct economic value, this important and fragile landscape is well recognized in terms of the diversity of medicinal plants. The knowledge of use of ethnomedicine derived from plants, animals or other natural products for the cure of various ailments since time immemorial has been acknowledge by scientific community (Nath et al., 2011; Nayar, 1996; Prakash et al., 2008; Pandi et al., 2007).

2. Statement of the problem

The adoption of the 2030 Agenda for Sustainable Development seeks to end poverty and other deprivations through improved health and education, reduce inequality and spur economic growth - all while tackling climate change and working to preserve the oceans and forests. Out of the 17 Sustainable Development Goals (SDGs), the Agenda 3 which seeks for 'Good Health and Well-Being' revamp the importance of Traditional Knowledge System (TKS) particularly on traditional medicines for attaining better global health. However, paradoxically, academic interest on ethnobotany, and especially medicinal plants, is increasing while rural and indigenous people's knowledge about the use of plants for medicinal purpose is declining (Hamilton, 2004; Weckmuller, et al., 2019).

Studies around the world have shown that there is a significant decline in intergenerational transfer of knowledge on traditional medicine. Lack of interest among the younger generation, urbanization, and preference for modern medicine in one hand and the destructions of biodiversity and habitat loss through rapid deforestation and climate change on the other are the recurrent issues leading to such declining trends. Study conducted by Daimari, et al. (2019) and Swargiary et al. (2019) in the Kokrajhar and Chirang districts of B.T.C., Assam reveals that the traditional knowledge bearers are declining (27 percent) and are very

insignificant among aged below 40 years (4 percent) and further asserted that these traditional knowledge bearers are always illiterate, poor and rural based livelihood.

The traditional medicinal knowledge of the forest dwellers, especially Bodos represents a critical yet vulnerable repository of therapeutic wisdom that faces multiple contemporary challenges. Despite its historical significance and continued relevance in rural healthcare, this knowledge system remains inadequately documented and scientifically validated. Several interconnected problems underscore the urgency of comprehensive ethnobotanical research among the Bodo communities.

First, the oral nature of knowledge transmission makes it highly susceptible to loss. As Singh et al. (2019) noted, there are no written sources or documents about traditional Bodo medicines, with traditions transmitted orally from one generation to the next. This vulnerability is exacerbated by rapid socio-cultural changes, urbanization, and the declining interest of younger generations in traditional practices. The demographic analysis reveals that most traditional knowledge holders are aged above 50 years, with 74% of informants in this age group Swargiary et al. (2021), indicating a critical knowledge gap among younger community members.

Second, environmental degradation poses a significant threat to the availability of medicinal plant resources. Traditional healers report difficulties in obtaining certain plant species due to deforestation, human encroachment, and population growth, which have led to the disappearance of several forest areas that previously provided raw materials for traditional medicines Singh et al. (2019). This environmental pressure directly impacts the sustainability of traditional healing practices and threatens the conservation of medicinal plant diversity.

Third, there exists a substantial gap between traditional knowledge and scientific validation. While numerous studies have documented individual aspects of Bodo ethno medicine, comprehensive quantitative analyses using standardized ethnobotanical indices remain limited. The lack of systematic documentation hampers the potential integration of traditional knowledge with modern healthcare systems and limits opportunities for evidence-based drug discovery.

Fourth, the absence of standardized preparation methods and dosage protocols in traditional formulations presents challenges for both practitioners and researchers. As noted by Swargiary et al. (2021), most traditional healers do not follow precise and standardized methods of herbal formulation, with doses varying based on the healer's experience and the patient's condition. This variability complicates efforts to validate therapeutic efficacy and develop standardized treatment protocols.

Finally, the broader implications of knowledge loss extend beyond healthcare to encompass cultural identity, biodiversity conservation, and sustainable development. The traditional ecological knowledge embedded within Bodo medicinal practices represents a holistic understanding of human-environment relationships that could inform contemporary conservation strategies and sustainable resource management practices.

3. Objectives of the study

Keeping in view the nature of the Traditional Medicinal Knowledge of the forest dwellers and the trends of its utilization, the present paper is focused to study the following objectives:

- i) to assess the use of bioresources for medicinal purposes by the forest dwellers to cure various ailments,
- ii) to evaluate the trends of traditional medicinal knowledge among the forest dwellers, and
- iii) to promote inventories for sustenance of traditional medicinal knowledge as a carry forward for sustainable ecological management.

4. Database and Methodology

The study employed a multi-faceted approach combining extensive field surveys, structured interviews, and participatory research methods. A total of 450 households randomly selected from 11 notified forest villages of Ripu Reserve Forest were surveyed from January to June, 2013. Besides surveying using survey schedule, direct observations and focus group discussion methods were adopted to gather data particularly on knowledge on use of bioresources for medicinal purposes. Structural variables like age of the head of the households, their educational status, household consumptions on basic needs with major focus on medicines, among all six communities of the study area were considered. Data were compiled using excel spreadsheet that were later transformed into tables and diagrams to draw the desired results.

5. Results

5.1 Sample Distributions and General Awareness of TMK

In this study, traditional medicinal knowledge of informants was identified using self-reported information from six different communities from the notified forest villages of the Ripu Reserved Forest. The use of traditional medicines from bioresources by different communities are listed in the table below (Table-1).

Table-1: Community-Wise Distribution of Traditional Medicinal Knowledge

Communities	Total Households Surveyed	Households with Knowledge of TM	Percentage Share of Total Knowledge Pool
Bodo	233	85	41.87%
Rabha	110	50	24.63%
Santhal	60	40	19.70%
Urang	34	19	9.36%
Nepalese	13	9	4.43%
Total	450	203	100.00%

Overall, 45 percent (203 households) of the respondents across the five studied communities reported having some knowledge of traditional medicine. While the Bodo community, identified as the earlier settlers, possesses the highest volume of traditional knowledge (41.87 %), the distribution of this knowledge varies significantly along communities based on their hierarchy of settling in the study areas. The Nepalese who have migrated from the neighbouring countries of Nepal and Bhutan are basically cattle grazers and are found to have possessed the least knowledge on traditional medicine among other communities in the study area (4.43 %).

5.2 Actual Practice of Traditional Medicines among Communities

There is a notable gap between possessing traditional medicinal knowledge and actually practicing traditional medicines. Only 17.56 percent (79 households) are currently practicing Traditional Medicinal Knowledge (Table-2). When analyzing practice by community, the Bodos, and Santhals shows the highest dependency, while the Nepalese and the Urang show the lowest relative to their total population.

Table-2: Community-Wise Practice of Traditional Medicinal Knowledge

Communities	Total Households	Households Practicing TMK	Percentage to Total
Bodo	233	24	30.38%
Santhal	60	23	29.11%
Rabha	110	20	25.32%
Urang	34	9	11.39%
Nepalese	13	3	3.80%
Total	450	79	100.00%

5.3 Trends of Application of Traditional Medicinal Knowledge

The study reveals that there is a significant decline in the depth and transfer of Traditional Medicinal Knowledge (Table-3). The households headed by the younger age group (below 40 years) seen to have lesser knowledge with regard to the use of Traditional Medicines (16.46%) while it increases with the increase with the age of the head of the households. The households headed with age-group 60 and above reveals highest percentage (50.63%) stating that they have better experience with regard to knowledge on Traditional Medicines.

Table-3: Age-Wise Practice of Traditional Medicinal Knowledge

Age of Respondents	Total Households	Households with Medicinal Knowledge	Percentage to Total
Below 40	189	13	16.46%
40-59	195	26	32.91%
60 & Above	66	40	50.63%
Total	450	79	100.00%

5.4 Application of Traditional Medicinal Knowledge to Various Cures:

With regards to the applications of traditional plant medicine, it is evident from **Table-4** that such medicines are applied during emergencies for sudden relief (40.51%). Other applications include general ailments (22.34%), orthopedics (15.26%), childcare (12.26%), and childbirth (9.54%). The reliance on Traditional

Medicines extending only up to sudden relief rather than complex conditions suggests a lack of in-depth knowledge among modern practitioners for treating critical ailments.

Table-4: Use of Traditional Medicines to Various Cures

Cures Applied	No. of Households	Percentage to Total
Emergency	32	40.51%
General	18	22.78%
Orthopaedic	12	15.19%
Child Care	10	12.66%
Child Birth	7	8.86%
Total	79	100.00%

6. Discussions

The Ripu Reserve Forest, located in the foothills of the Eastern Himalayas within the Bodoland Territorial Council (BTC), Assam, serves as a critical repository of Traditional Medicinal Knowledge (TMK). This region is a unique geographic entity and a recognized biodiversity hotspot, acting as a transition zone between mountain and monsoonal systems. It hosts a remarkable variety of plants with high medicinal value, many of which are endemic.

The communities living in this rich biodiversity hotspot possess in-depth knowledge of traditional medicines and has been practicing for their healthcare since long. This study reveals that though a significant number of households have knowledge on Traditional Medicines, only 17.56% (79 households) actively practice it. The distribution of this knowledge is heavily influenced by community settlement history and cultural ties. Bodos, as the earlier settlers, they hold the largest share of knowledge (41.87%) while the Urang and Nepalese (9.36% and 4.43%, respectively), hold smaller shares of the total knowledge pool.

A significant declining trend with regard to the application of TMK is being revealed in this study. The depth of TMK is notably declining among younger generations. Households headed by individuals under age 40 show significantly less knowledge and practice (approximately 13.76% to 16.46%) compared to those aged 60 and above, where knowledge and experience remain highest. Furthermore, the application of traditional medicine is increasingly limited to emergencies and sudden relief (40.51%), rather than treating complex or chronic conditions. This focus on immediate relief suggests a loss of in-depth expertise required for critical medical situations.

7. Conclusions

To conclude, though the significance of Traditional Medicinal Knowledge among the remote and destitute families still remains undisputed, the study signifies the decline and lack of in-depth knowledge about the use of traditional medicinal practices. This trend is exacerbated by urbanization, a preference for modern medicine, and environmental degradation. Current usage is primarily restricted to emergency relief,

indicating a lack of in-depth therapeutic knowledge for critical ailments. To safeguard this vulnerable heritage, there is an urgent need for proper documentation through print and digital media. There is a need for creating awareness and training about the importance and use of traditional medicinal knowledge by community leaders, medicinal practitioners in collaboration with modern sciences. Besides this, the loss of biodiversity, the store house of medicinal plants, needs to be addressed particularly through granting higher conservation strategies like converting some specific endemic areas into Biosphere Reserves or National Parks.

Conflict of Interest: The author declares no conflict of interest.

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