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Indigenous Ecological Knowledge and Livelihood Sustainability: With Special Reference to the Missing Community of the Kaziranga Landscape, Assam

Aterko Doley

Designation: Research Scholar of Jawaharlal Nehru University, New Delhi.

Email: Aterkodoley@gmail.com

Nandeswar Pegu

Designation: Guest faculty, Department of History, Jawaharlal Nehru College, Boko, Assam.

Email: Nandeswarpegu2018@gmail.com

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ABSTRACT

Indigenous ecological knowledge (IEK) shapes how riverine communities manage land, water, and biodiversity while securing their livelihoods. This study examines the Mising community living in and around the Kaziranga landscape of Assam, where recurrent Brahmaputra floods, protected-area regulations, and market change intersect with everyday resource use. Using a mixed-methods design that combines household surveys, focus group discussions, key informant interviews, and participant observation across selected villages, the study documents Mising practices related to flood-adapted housing, rice and fish-based subsistence, wetland and fishing management, handloom weaving, and the gathering of wild plants. Results indicate that this knowledge supports livelihood diversification, reduces vulnerability to floods, and promotes conservation-friendly resource use through seasonal restrictions and customary norms. At the same time, restricted forest access, land erosion, climate variability, outmigration of youth, and limited institutional recognition are eroding the knowledge base and its

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transmission across generations. The study argues that sustainable livelihoods in Kaziranga's buffer areas depend on integrating Mising ecological knowledge into participatory conservation planning, disaster preparedness, and community-based enterprises. It recommends co-management arrangements, documentation led by the community, and skill-building programmes that link cultural heritage with income generation. These findings contribute to debates on biocultural conservation and inclusive, locally grounded sustainability policy.

Introduction:

Indigenous ecological knowledge is the body of knowledge, practice and belief that communities build through long, direct contact with their surroundings and pass on across generations. In floodplain landscapes like the Brahmaputra valley, where rivers shift course and monsoon floods come every year, this knowledge shapes how people build, farm, fish, gather and share resources. It is increasingly seen as relevant to biodiversity conservation and climate adaptation.

The Kaziranga landscape is best known for the one-horned rhinoceros and its UNESCO World Heritage status. Less visible is the human landscape around the park: villages of farming and fishing communities, among them the Mising, who have lived beside the Brahmaputra and its tributaries for generations. Their relationship with river, grassland and wetland is seldom treated as knowledge in its own right. In policy, the community more often appears as a pressure on the park or as a flood-affected population needing relief.

This paper starts from a different point. It asks how Mising ecological knowledge supports livelihoods in a hazard-prone environment, and what makes those livelihoods sustainable or fragile. It has three aims:

1. To describe the main domains of Mising IEK.

2. To examine how this knowledge contributes to livelihood sustainability, using the sustainable livelihoods framework.

3. To identify the pressures on the knowledge and suggest ways to support it.

The discussion is conceptual and review-based. Field evidence from the study villages should be used to test and extend the points made here.

Research Methodology:

This study uses a mixed-methods design, combining qualitative ethnographic inquiry with quantitative livelihood assessment, to examine how Indigenous Ecological Knowledge (IEK) supports livelihood sustainability among the Mising community in the Kaziranga landscape.

Study area and sampling. Selected Mising villages in the floodplain areas around Kaziranga National Park will be chosen purposively. Households will be selected through stratified random sampling, while key informants such as elders, village headmen, fishers, farmers and women weavers will be identified through snowball sampling.

Data collection. Primary data will be collected through structured household surveys, semi-structured interviews, focus group discussions and participant observation. These will cover flood adaptation practices (such as stilt houses), traditional farming, fishing, plant use and resource-use norms. Field walks and transect observations will document local habitat use. Secondary data will come from government records, census reports, journals and park management documents.

Data analysis. Qualitative data will be transcribed, coded and analysed thematically. Quantitative data will be analysed with descriptive statistics, and livelihood sustainability will be assessed through a livelihood asset framework covering natural, social, human, physical and financial capital.

Conceptual and framework:

IEK and sustainable livelihoods

Berkes (1999) describes traditional ecological knowledge as a cumulative body of knowledge, practice and belief that evolves through adaptive processes and is handed down culturally. It works at four linked levels: local knowledge of species and landscape, resource-use practices, social institutions that regulate use, and a worldview that gives these meaning. Because it is tested by repeated experience of change, it is closely tied to adaptive management and resilience (Berkes, Colding and Folke, 2000).

The sustainable livelihoods approach asks whether a livelihood can cope with and recover from stress and shocks, maintain its capabilities and assets, and avoid undermining the natural resource base (Chambers and Conway, 1992). The approach groups assets into five capitals: natural, human, social, physical and financial.

The two ideas fit together. IEK is a form of human and social capital: skills, shared rules and trust. Its main function is to protect natural capital and to reduce exposure to shocks such as floods. This paper therefore

reads Mising IEK as the community's adaptive capacity, and tests livelihood sustainability against the five capitals.

The Missing community and the Kaziranga landscape The landscape:

Kaziranga lies on the southern bank of the Brahmaputra in the Golaghat, Nagaon and Sonitpur districts of Assam, with the Karbi Anglong hills to the south. Its tall grassland, marshes, wetlands (beels) and patches of moist forest depend on the river's annual flood. Floodwater renews soil and wetlands, but it also pushes animals toward higher ground and cuts off nearby villages. Communities in the park's fringe live inside the same flood cycle as the wildlife.The community. The Mising are a Tibeto-Burman-speaking people and one of the larger Scheduled Tribes of Assam. Tradition places their origin in the hills of present-day Arunachal Pradesh, from where they settled the river plains. Mising villages are typically located on riverbanks and low floodplain terraces, which gives them direct access to fertile silt, fish and bamboo, and direct exposure to flood and erosion.

Social life is organised around clans, kinship and the village council known as the Kébang. Belief and ritual combine older traditions, such as reverence for Donyi-Polo (Sun and Moon), with later Vaishnavite influence. Festivals such as Ali-Aye-Ligang, which marks the start of the sowing season, tie the social calendar to the agricultural one.

Mising settlements are spread along the Brahmaputra and its tributaries in several districts of upper and central Assam. Which villages lie within the Kaziranga landscape, and how close they are to the park boundary, should be fixed from the study's own sample.

Indigenous ecological knowledge of the Mising IEK is best understood as a set of connected domains, each tied to the flood regime.

Flood-adapted settlement. The traditional Mising house, the chang ghar, stands on bamboo or timber stilts. Raising the living space lets water pass beneath during floods, and the lower area is used for livestock, storage and boats. Materials such as bamboo, cane and thatch grass are gathered locally and can be repaired cheaply after damage.

Agriculture. Farmers match crops to water conditions. Early-maturing and flood-tolerant rice types, together with sowing times set by the river's pattern, reduce the chance that a single flood destroys the year's food. Silt left by floodwater renews the fields. Households also keep kitchen gardens with vegetables, spices and fruit, which add diversity and a food reserve.

Fishing and wetlands. Villagers know how fish move with rising and falling water and which wetlands hold which species in which month. Bamboo traps and nets are made at home and used seasonally, and fish are dried for later. Communal fishing at fixed times is a way to share the catch and avoid overuse.

Plants and local materials. Wild vegetables, medicinal plants, fibres and building materials are collected from fields, homestead groves and common land. Rice beer, apong, is brewed with a plant-based starter, which shows detailed knowledge of local species and of their seasons.

Weather and calendar. Elders read signs in the river, the sky, the behaviour of birds and insects, and the flowering of plants to judge when floods or dry spells are coming. Festivals and rituals fix the calendar and pass this knowledge on.

Institutions and values. The Kébang settles disputes and sets community norms. Shared labour at sowing, harvest and house-raising, along with taboos and respect for the river, keeps risk collective rather than household-level. Women hold much of this knowledge, in weaving, brewing, seed saving and food preparation.

Livelihood systems and sustainability:

Mising households rarely depend on one source of income. A typical livelihood mixes rice cultivation, fishing, livestock such as pigs, poultry and ducks, handloom weaving, bamboo and cane crafts, apong brewing, and wage work. More recently some households earn from tourism, through homestays and cultural performances. This diversity spreads risk: when a flood destroys a crop, fish, livestock and craft income can fill part of the gap.

The table shows how IEK supports each livelihood capital.

Capital	**How IEK contributes**	**Example**
Natural	Protects soil, water and species through seasonal and moderate use	Timed fishing; use of silt for fertility
Human	Builds skills that need little outside input	Weaving, house-building, trap-making

Social	Shares risk and enforces norms	Kébang; shared labour; communal fishing
Physical	Provides low-cost, repairable assets suited to floods	Chang ghar; bamboo boats and traps
Financial	Supports small, diverse income sources	Handloom sales, brewing, homestays

Three features make these livelihoods relatively sustainable. They depend mostly on local materials and so need little cash. They respond to the flood rhythm instead of resisting it. And they rest on shared rules and reciprocity, which spread losses across the village. Sustainability here does not mean the absence of hardship. It means the community can absorb a shock, rebuild and continue without exhausting the resource base.

Challenges and threats:

The same knowledge system now faces pressures that it was not built for.

• Erosion and heavier floods. Bank erosion and sand deposition can remove or bury farmland and whole settlements. Embankments and roads may alter water flow in ways local knowledge did not anticipate.

• Climate variability. Irregular rainfall and flood timing weaken the calendar and the weather signs that elders rely on.

• Park-related restrictions. Limits on collecting fish, fuel, thatch and other resources near protected areas can reduce access to traditional resources and create friction with park authorities.

• Human-wildlife conflict. Crop damage and livestock loss from wild animals raise costs for fringe households.

• Market and lifestyle change. Cash needs, concrete housing, packaged goods and wage work reduce the use of traditional materials and skills.

• Out-migration of youth. When young people leave for education or jobs, language, craft skills and ecological knowledge pass on less often.

• Uneven benefits from tourism. Visitors to Kaziranga bring income, but the share reaching Mising households is often small.

These pressures interact. Loss of land to erosion pushes people toward wage work, which weakens the transmission of knowledge, which in turn reduces the community's adaptive capacity for the next flood.

Policy implications and way forward:

1. Recognise IEK in management plans. Park, forest and disaster-management plans should include community knowledge of flood behaviour, wetlands and resource use, and involve the Kébang in decisions.

2. Document with the community. Knowledge should be recorded in the Mising language, with community consent and control, and benefits shared as the Biological Diversity Act, 2002 intends. Forest rights provisions should be applied where they are relevant.

3. Support diversified livelihoods. Handloom and craft marketing, community-run homestays and fair access to tourism income can raise financial capital without weakening the resource base.

4. Build flood-compatible infrastructure. Housing schemes, embankments and roads should be designed with, not against, stilt housing and natural drainage.

5. Link local indicators to early warning. Elders' observations can complement formal flood forecasts.

6. Strengthen transmission. Language teaching, festivals and school or youth programmes can keep knowledge in use.

Conclusion:

Mising indigenous ecological knowledge is a practical system for living with a changing river. Through stilt housing, flood-timed farming, seasonal fishing, local material use and shared institutions, it supports diverse livelihoods that draw lightly on natural capital and recover from shocks. Erosion, climate variability, resource restrictions, wildlife conflict and the loss of young people now strain this system.

For the Kaziranga landscape, conservation and community livelihoods are not separate goals. A community that can stay on its land and keep its knowledge in use is a partner in protecting the floodplain. Future research should test these points with field data from the study villages, using interviews, observation and participatory mapping, and should record how knowledge differs by age, gender and distance from the park.

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