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Traditional Mechanism and Folklore's/Myths & their role in Natural Resource Management

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Abstract
This research investigates the pivotal role of traditional mechanisms, indigenous folklore, and myths in the sustainable management of natural resources in the Gilgit region of northern Pakistan. Based on ethnographic fieldwork including in-depth interviews, participant observation, and oral histories the study documents longstanding indigenous practices such as equitable water distribution through kuhls (traditional irrigation channels), regulated forest and pasture use, wildlife conservation norms, and community-based disaster preparedness in fragile high-altitude ecosystems. Folklore and myths, featuring elements like peri (fairies), mountain spirits, sacred animals (e.g., ibex as divine mounts), and shamanistic traditions (bitan), function as powerful cultural tools that embed ecological ethics, taboos, moral codes, and guidelines promoting restraint, communal equity, and harmony with nature. These narratives have historically transmitted adaptive knowledge across generations while fostering social cohesion and collective environmental stewardship. However, rapid modernization driven by Western scientific dominance, state-centric policies, climate change pressures, urbanization, youth out-migration, formal education, and market economies is causing these time-honored systems to fade swiftly. The erosion risks losing resilient strategies suited to Himalayan vulnerabilities. The article advocates for the systematic documentation and integration of this vanishing traditional ecological knowledge with contemporary conservation frameworks to promote inclusive, culturally grounded, and truly sustainable resource management.

Keywords: *Indigenous knowledge, Traditional ecological knowledge, Folklore and myths, Natural resource management, Gilgit-Baltistan.*

Introduction

Indigenous Peoples, who represent around half a billion individuals, manage approximately 25% of the Earth's land, which is home to the majority of the planet's biodiversity. Policymakers can no longer overlook the substantial evidence that highlights the importance of Indigenous knowledge and rights in combating biodiversity decline. Recent studies involving Indigenous communities in Peru, Kenya, India, and China demonstrate that their cultural values and perspectives foster harmony with nature and promote social fairness. Enhancing and supporting Indigenous traditions can result in effective, locally-driven just and cost-efficient conservation efforts, furthering global development objectives. However, Indigenous knowledge faces numerous challenges. Ahead of the CBD COP15 in China, it is crucial for decision-makers to incorporate Indigenous perspectives and values into the new Global Biodiversity Framework

(GBF) (Swiderska et al., 2020). Customary laws and indigenous knowledge systems have played an important role in sustainable forest management. The indigenous communities by employing Community Based Natural Resource Management (CBNRM) locally made customary laws had managed to conserve their natural resource management. The Baduy tribe in Indonesia demonstrates the incorporation of customary laws into their forest conservation. Their indigenous techniques based on local mechanisms and customary laws ensured the sustainable management of natural resources. These customary laws made on the basis of indigenous wisdom not only protected their natural resource but their cultural heritage and community cohesion. (Asteria et al., 2022). Similarly, India's Forest Rights Act (2006) reflects a formal recognition of indigenous wisdom and customary practices based on that indigenous knowledge acknowledges the rights of tribal communities and traditional forest dwellers to manage and conserve forests based on their customary laws. Studies points that the IFRA has empowered local people to share their input indecision making processes, thereby promoting environmental justice and sustainable development (Kumar, 2024). In Gilgit Baltistan there are some specific areas where there are forests in abundance like Astore, Chilas, Haramosh, Bagrote, Napura Baseen and the Baltistan region. The local law regarding interaction with forest in the region was also based on indigenous wisdom and customary law, which steered the entire forest management in Gilgit District. The rule and regulations regarding jungle were that a cutting green tree was strictly prohibited and it was considered a heinous crime, even, green zoon was strictly prohibited to cut from the jungle. A local person Zaitu regularly visits the forest anyone even a female cut any green tree or plant were also fined heavily, only dry trees or deadfall entrees were allowed to utilize for domestic and construction purposes.

Research Question:

How have the traditional knowledge like indigenous practices, myths and folklores contribute to biodiversity conservation?

Research Design:

This study has been carried out through the lens of Traditional Ecological Knowledge Theory by employing qualitative methods of inquiry, focusing on an in-depth analysis on indigenous knowledge mechanism and its role in natural resources management in Gilgit region. The case study method is appropriate for exploring complex social phenomena's in their life context (Yin, 2018). The research has been taken in Gilgit region which is known for its mountainous landscape, abundant bio-diversity and variety of indigenous communities. Therefore, an explanatory approach was employed as viable in order to help identify salient themes and features. For the sake of data collection in-depth interviews(IDI's) and Focused Discussion Groups (FGDs) were conducted between September15, 2024 to December 04, 2024from thirty two people from different localities of Gilgit district, including general community, Lumberders , climate activists, farmers, herdsman and some old age women from the rural localities of Gilgit district. Qualitative research methods are primarily used to gain a deeper understanding how meaning is co-created, explore lived experiences, examine cultural rituals and investigate oppressive practices (Atkinson). Qualitative interviews acted as a useful tool to retrieve data and understand how and why indigenous knowledge has not given due importance although the region is facing environmental degradation on the face of modernism, urbanization and climate change.

Literature Review:

Indigenous knowledge also known as traditional knowledge or traditional ecological knowledge plays a significant role in sustainable management of natural resources. This local wisdom which has been build and refined for thousands of years in direct interaction with the natural

environment based on the observations and experiences of native communities (F. Berkes et al., 2000). In the region like GB indigenous knowledge mechanism have played a pivotal role to the natural resource management particularly in the context of agriculture, water use, forest management, land grazing and biodiversity conservation(L. Ali & Avdic, 2015). This literature review provides a comprehensive analysis of the role of indigenous knowledge in natural resource management with a special focus on the distinctive dynamics of Gilgit district, renowned for its versatile ecosystem, climate and intricate socio-cultural framework. Indigenous knowledge system include various practices, beliefs and insights handed down through generation carefully adopted to the specific environmental conditions of the area (Tuhiwai Smith, 2012). Indigenous knowledge systems in resource management are deeply rooted in cultural traditions and community driven practices, including collective decision making and resource sharing (Jentoft, Van Son, & Bjørkan, 2007). In natural resource management indigenous knowledge typically includes practices like crop rotation, water management, agroforestry, and species conservation that help maintain ecological balance and support the long-term sustainability of resources (Gadgil et al., 1993). In Gilgit district, indigenous communities have developed an advanced resource management practices in response to the regions harsh environmental conditions, such as mountain terrain, scarce water resources and extreme weather patterns. Research show that these communities use traditional methods like Khul (irrigation channels) and Shamilat (common grazing) and indigenous forest management systems to tackle these challenges (Nazli, Liu, Wang, Soomro, & Change, 2024). These systems have proven resilient over centuries and their role in managing natural resources is indispensable for the survival of local communities. The culture that has flowed through generations and been handed down to us is a legacy of symbolic representations, sometimes of events and other times of objects, which occur and exist in the world around us (Mathur et al., 2017). Tylor proposed an interpretation of culture, suggesting that it encompasses the knowledge, beliefs, practices, and skills individuals acquires members of their society. Thus, our understanding of culture, knowledge, and behavior relies entirely on semiotic mediators, which enable us to comprehend and engage with them (Hallinger, Heck, & improvement, 1998). Local wisdom or folk knowledge is based on continuous observation, interaction, and repeated responses to the events that take place in the environment where people live (Harris, 2000). People in specific settlements possess distinct environmental knowledge, shaped by their interactions with the surrounding landscape. They interpret the intentions of the land and nature through the experiences they have encountered and the knowledge they have gained over time (Lewis, 2000). A person from a farming background, for example may predict the crop yield for the upcoming year by assessing the amount of rainfall received and forecasting what is still to come. Indigenous knowledge is not transmitted or understood in a linear way it is undoubtedly contextual and multifaceted. This knowledge embedded in various criteria and categories is shared within communities of similar cultural practices where there is a common understanding or interpretation of its presence and significance. As a result, people from similar cultures attribute the same semiotic value to traditional cultural expressions. The term "traditional cultural expression," as defined by the World Intellectual Property Organization refers to the local knowledge passed down through generations via stories, rituals, practices, ceremonies and more(Dechend et al., 2003). The ritual markers are however enriched with symbolic inferences, which are derived from the knowledge which has been observed, practiced and transmitted in a society. The 23 rituals based on the indigenous knowledge are formulated with laws to abide them, so that they make sense of what is happening and how is it been done. For an instance, the rites of birth, marriage and death of people with a distinctive culture might not be done or appreciated if they do not undergo or

comply with the ritualistic and costmary laws of that culture (Hunter, 2002). Negi's study examined the relationship between the habitats and cultures of settlements in Uttara hand, Central Himalaya, revealing a strong connection between their religion and the ecosystem. The community's traditional knowledge-based practices emphasized the preservation of natural resources through cultural taboos and rules. These practices were deeply rooted in their religious beliefs, where forests, water, and landscapes were offered to a supreme deity with the promise of conservation and non-exploitation. This ritualistic approach played a significant role in mitigating environmental crises and degradation (Negi & Development, 2010). There are many varieties of the semantic entities in every culture and among every indigenous people, which in their respective ways manage conditions to cope with emergencies, needs, conflicts and crisis.

Discussion and Analysis:

When someone plans to construct a house, he had to move an application to the jungle committee which is composed of three to four people, one of them would be a carpenter. The carpenter's job was to sit with three people and whenever someone applied for building a house, he would along with his team. A local thorny green rose like plant and local watch man who look-after jungle related tasks. Inspect the DPC (Damp Proof Course) of that house that has been build. After the examination of the structure, the carpenter would assess and inform how much wood would be required for the construction of that person's house. The person had to pay 50Rs for standard size wooden plank. More than 200 wooden planks can be made from a single tree depending on his age and size of the tree. Once, the payment was made the person would receive an allow slip certificate from Jungle committee. And a person would be deputed to accompany them. The purpose of deputing this person was to ensure that the individual who had received permission would not cut more tress then they were allowed. Then, this money is used to pay salaries of forest employees. Moreover, anyone who mishandled the jungle was fined heavily. "Mai hisab ech anu qanoon bodo misto asul" "In my opinion this law of dealing with forest was wonderful" Another respondent no 2 from Napura- Baseen village 10 km from main Gilgit city told me that in the past, when someone brought wood from the jungle, the members of the jungle committee would inspect his wood and if he has cut green tree, his wood would be confiscated and impose a heavy fine on him. This was the indigenous system which people employed to deal with their forests. The people back then were very pure, honest and sincere who himself had very personal and sacred relationship with green tress, as they themselves avoided illegal forest cutting. For the purpose of fuel as entire Gilgit Baltistan is dependent on wood for cooking and heating as there is no natural gas available in the region, for domestic use the practice was that young people would go into the jungle collectively one person from each household and they cut only a dry tree or twig for domestic usage. They would load this wood onto donkeys and bring it home to burn as fuel during winters. For construction, there was a special rule. Anyone who wants to wants to cut wood for building purposes had to submit an application to the jungle committee. They would then survey the construction site, and the person would have to pay 100 RS per tree. Only after that, permission would be granted. The committee members would mark trees (mature trees only) to ensure no other trees were cut down, as they only allowed to cut big and mature trees. Cutting small or young trees was strictly prohibited. In case of emergency like any death in any household, member of that family were allowed to get wood but in a certain amount for the funeral purposes (Respondent ID 01, ID 02 interview dated on Sep, 15, 20124).

In a nutshell, Green trees and plants plays a crucial role in sustaining ecosystem health by enhancing soil stability, regulating water cycles and supporting biodiversity. By refraining from cutting live vegetation, communities help forests regenerate and stay sustainable for future

generations. Moreover, the indigenous culture in GB regard forest as sacred with green tree soften perceived as living beings possessing inherent value. This practice prevents overexploitation ensuring that resources like timber, medicinal plants and non-timber forest products are available in the long term. The customary law that prohibits the cutting of green trees and plants reflects a comprehensive approach to forest management, emphasizing ecological balance, sustainability, and cultural significance. Although adapting these practices to modern contexts can present challenges, incorporating them into current forest management strategies provides a pathway for more sustainable and equitable resource use. By honoring and upholding customary laws, we can draw from the knowledge of indigenous and local communities to tackle global environmental challenges

The plantation rules in Gilgit region is not different from the Matheding communities of Limpopo, South Africa which employed indigenous mechanism to enhance plant growth and resilience to environmental stressors. They also used indigenous knowledge based mechanism for sustainable growth of plants, they also had a certain time period where they sow sapling for better plant growth. (Rankoana, 2016). Similarly, in the past there used to be no plant nurseries in GB, people used to borrow saplings from each other. Plantation of fruit trees began on February4 till March 20th, as the soil starts warm up in this time. After this time period the plants would begin to wilt if sowed due to the changing weather as the temperature gets mild and the intensity of winters lowers. In addition, during this season a special kind of wind blows that promotes better growth of these plants known as tom baragereouschi there was special method for protection of these saplings because in ancient times, an open grazing system was in practice. In the summers, the cattle use to be in high-altitude pastures, so there was no issue with protecting the smaller plants. However, when the season changed and the cattle moved down from the main pastures to lower areas, protection of these plants became a significant concern. There local Community who would gather together and fix a day. On that day, the cattle were movedfrom18 Wind which blows in Feb/ March, which conceives tress to grow in this season the pastures to the inhabited lower lands, and before that, the people would ensure complete protection of their plants. People used to employee three kind of methods for protection of these new saplings. (1) people would wrap clothes around these plants (2) Some people would use thorny plants and wrap around that saplings as a barrier to keep animals from eating them(3)Some people would mix dog poop in water to make a paste which they would apply these young saplings. One of other respondent said that there were some people who use cow dung to mix it with water and then make a paste and then apply it these new saplings. For the growth of these plants, an organic fertilizer was used and along with that bones were also buried which provided minerals in the bones that were beneficial for the growth of the plants. Moreover, there were some indigenous methods to protect small plants from diseases as well. Usually, small trees would get infested with tiny insects, and to protect them from these insects, ash would be applied over the entire plant, ensuring that the ash did not reach the roots. This was crucial because, if the ash came into contact with the roots, the plant would dry out due to the harmful effects of the ash on the roots. In addition, one of the respondent from Gilgit city told me that they had great respect towards fruits trees. Another female respondent from Gilgit region said that in the past, people did not plant the same species of plants together. Instead, they planted different species because the soil has varying layers, and the roots of plants can only reach a certain depth. Planting the same species in one area leads to higher precipitation, which can become a significant environmental challenge. Therefore, ancient people preferred to plant different species to maintain a balanced ecosystem (Respondent ID 6, ID 14). Myth related to Walnut Tree Cutting in Haramosh valley one of my other respondent articulated a myth like story regarding walnut

tree plantation that person along with his elder son went to transplant a walnut tree which sprouted under a large stone. After digging for some time, the man came under the heavy stone, and tragically, he lost his life. After his death, a local myth developed throughout the area that no man should ever plant a walnut tree otherwise he would face a similar bad luck and don't transplant a walnut tree to any other location. Since then a myth developed in Haramosh village of Gilgit district to not relocate a walnut tree. In case if transplanted this task would be carried out by female member of the family. So, these indigenous developed myths and folklore had played an important role in the conservation of this walnut tree (respondent ID 17, interview dated September 2024). Forests are frequently seen as only in terms of their economic value as timber sources, yet their ecological and cultural significance goes beyond this limited perspective. They are habitats for numerous species, help regulate climate and ensure the availability of clear water and air. Additionally, forests hold deep cultural significance being honored as sacred places in various traditions such as Celtic groves, Native Americans sacred forests and in Japanese Shinto practices. The spiritual and symbolic meanings of forests are deeply embedded in global folklore from Kodama are the spirits of trees in Japanese folklore's. These supernatural beings are believed to inhabit ancient trees in forest and are treated with great reverence. If Kodama tree is cut down, it is said to bring misfortune lumberjack. Kodama are usually perceived as protectors of the forests ensuring a harmony between nature and humans. Their presence can sometimes be heard in the form of eerie echoes. In addition, a similar myth exists in Middle East some spirits (Jinn) are believed to reside in forest and wooded areas specially Shaitan (evil Jinn). These spirits are renowned for their shape shifting abilities and their interaction with humans often causing travelers to lose their way in the forest. Jinn/ spirits in the forest are frequently seen as mischievous or vengeful being (October 6, 2024).

There were similar myths regarding forest in Gilgit region and these myths were almost two to three hundred years old. It was believed that cutting a green tree was a sin as they are living beings and have feelings like humans as well. One of the respondent said that trees use to hold very respectful place in our culture and we have very strong attachment with our trees. The Saro held great cultural significance in the Gilgit region first it emitted a pleasant fragrance. Second, people would bring the dry leaves of this pine tree (Saro) to home. These dry leaves were consumed as a treatment of diseases for animals and human beings. A fire would be made in a local fry pan type tool and the dry leaves were placed on top. It was a common belief that those who engage in the business of jungle do not have blessings in their homes. If someone earns 1000/PRs from the jungle business so, he uses to incur 2000/PRs loss. There was another myth related to forest cutting in Gilgit region that those who get engaged with forest cutting had bad luck for himself. One of my respondent said that he was engaged in tree cutting and selling business and after couple of years he lost his right eye in an accident as it was believed that bad spirits use to dwell in these dense forests. Then he left this tree cutting business and started another business for his livelihood. So, the myths and folk lore's have great cultural significance in the region which helps conservation of natural environment and saves degradation of the natural environment. Moreover, forest have equal significance for humans and other wildlife animals as well. So these myths contribute a lot for the conservation of natural environment. Another respondent, from Haramosh valley which lies 65 km from main Gilgit city narrated a myth that one day one of his goat didn't came to home in the evening, he along with his daughter went to search for that goat in jungle in between he also lost his daughter in the forest as she was minor, then man neither found her daughter nor her goat, in the morning he came to know that daughter who slept under a big tree during night was dead in the morning. So, it was believed that bad spirits have killed her daughter during the night. So, there was a belief that bad

sprits dwell in tress as not to cut them. Such kind of incidents, myths and folklore had an important role in forest conservation in Gilgit-Baltistan. Another myth related to a wild weed was Espundar. Rotational grazing practice in which livestock are moved between paddocks to give forage time to recover has become common in the U.S and Canada. This particular approach improves soil fertility, boosts carbon storage, prevents over grazing and also enhances water retention (Agriculture, 2022). Similarly, in the Trans-Himalayan region of Ladakh, India agro pastoral communities engage in seasonal migration patterns to high altitude pastures during the summer and winter seasons. This migration is managed by local authorities who supervise the movements of livestock and implement the community regulations to avoid over grazing. These practices are rooted based on indigenous wisdom ensuring the sustainable use of the regions scarce resources in its cold arid environment (Ladon, Nüsser, & Garkoti, 2023). Similarly, in East Africa, Pastoral communities like Maasai practices (seasonal migration) to approach grazing lands. These migrations are based on traditional knowledge and steered by locally made customary laws to protect the grazing lands and ensure resource availability during dry seasons. By and large, due to the modernization, land tenure insecurity and climate change is disturbing these indigenous practices (Djordjević-Milošević & Milovanović, 2019). In Gatling Rasuwa District of Nepal, with women playing a crucial role in carbon management and pasture productivity. Despite their significant contributions women input is often over-looked in decision making. The community's indigenous knowledge supports sustainable grazing land use socioeconomic changes are increasingly threatening these practices (Deshar &Koirala, 2020). Similarly, in GB there also exit seasonal migration patterns where people take their cattle to pastures depending on the availability of grass in specific times to pastures usually around May 20, when everyone would take their cattle to the pastures. The pastures were also divided in a particular way. There was some low altitude pasture where people for almost more than a month graze their cattle before going to main pasture land this was due to the reason that the main pastures were at high altitude where grass growth was slow due to severe weather and high altitude. Once the grass in the lower areas were depleted then everyone move their cattle up to the higher pastures. One of my respondent from Nagaral Gilgit told me that in their area they had a rotational grazing concept. Similarly, people have divided pastures, one-year people use to graze their cattle on one side and the next year on the other side. This divisions of pastures land and rotational grazing mechanism actually protects from over grazing and save these sides for coming years. A third respondent from Haramosh Valley said that before taking their cattle to main pasture land, there was a local custom in which everyone slaughters an animal according to his means. The meat was collected in one place and then equal share of that meat would be distributed among all the people of the village.

Conclusion:

We have comprehensively covered the existing forms of indigenous knowledge utilized for natural resource management and biodiversity conservation and the associated and emerging challenges to indigenous knowledge mechanisms. The study of indigenous knowledge mechanisms in Gilgit district emphasizes the deep role the indigenous knowledge based practices play in sustainable management of natural resources. The traditional knowledge which is deeply entrenched in the local cultural and religious context of the region has thoroughly demonstrated its potency and effectiveness in fostering environmental sustainability and resource conservation over centuries. The cases study if District Gilgit shows that the local and traditional knowledge mechanisms are not exclusively historical artifacts but are dynamic, adaptive and is pertinent to modern natural resource management challenges. These techniques commanded by locally and

mutually made customary laws offer valuable insights into the harmonious co-existence of humans and nature.

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