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Cattle Culture among the Gorkhas : Traditional Ecological Knowledge and its Role in Dairy Development in Assam

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Abstract: *Commercial dairy farming in Assam began during the British period, particularly after the Treaty of Segowali (1816), which facilitated the migration of Gorkha families from Nepal to Assam and other regions of India. Historically, the Gorkha community has been characterized by its unique pastoral systems and livestock management strategies, which have evolved over centuries. The indigenous knowledge systems that govern these practices are crucial for understanding how local communities interact with their environment, particularly concerning the sustainable management of dairy resources. By employing historical, analytical, and descriptive methodologies, this study elucidates the intricate relationships between cultural identity and ecological governance.*

At the core of Gorkha cattle culture is a profound respect for biodiversity and an understanding of ecosystem dynamics. The traditional practices associated with Gorkha cattle such as selective breeding, rotational grazing, and integrated crop-livestock systems demonstrate an sharp awareness of ecological stability, while significantly contributing to Assam's overall dairy production.

The study highlight the Traditional Ecological Knowledge (TEK) embedded within the Gorkha cattle culture presents a compelling narrative that intersects cultural heritage with contemporary sustainability practices in dairy development. The findings also reveal that the Gorkhas' cattle culture not only preserves ecological balance but also strengthens the socio- economic foundation of dairy farming in the state. These indigenous methods can be further incorporated to increase productivity and guarantee the dairy industry in Assam develops sustainably with the right kind of policy backing and scientific training.

Keywords: *Traditional Ecological Knowledge, Gorkhas, Sustainable Management, Dairy Farming, Socio-Culture Practice, Farming.*

Introduction: In Assam, commercial dairy production can be traced back to the British era. After the signing of the Treaty of Segowali in 1816, which strengthened ties with Nepal, the British administration encouraged the permanent settlement of Gorkhas and their families from Nepal to Assam and other parts of India. Later, following the Treaty of Yandaboo in 1826, when the British and the Gorkha army advanced into Burma, the relatives of these troops were given the opportunity to engage in buffalo rearing as a supplementary occupation (Upadhaya, 2017).Numerous Nepalese migrated to Assam in search of work as soldiers and Gopalaks (cow rearers), following the British colonization of the region, a process actively supported by the colonial administration. When the British first arrived in Assam, they were ambitious and full of promises; however, due to the state's sparse population, they struggled to achieve their objectives. Vast tracts of wasteland had been left behind by the depopulation and destruction caused by civil conflicts

and the Burmese invasions. To address this, the colonial authorities encouraged immigrants to settle in the province. In the absence of industries, Assam had no option but to rely on agriculture and land revenue for economic growth. People were offered favorable conditions for leasing land, and the British government seized every opportunity to maximize income collection. Grazing, which had traditionally been free "from time immemorial," was brought under taxation. On March 6, 1838, the East India Company introduced the Wasteland Rules to attract settlers and increase revenue. Under these rules, one-fourth of a land grant was perpetually revenue-free, while the remaining portion was exempt from revenue for a period ranging from five to twenty years, depending on the type of wasteland (Guha 2017). It was only after such colonial interventions that large-scale Nepali migration into Assam began. The British, perceiving the local population as "lazy," "opium-addicted," and "indolent," encouraged the settlement of surplus Nepali populations. Through these policies, the colonial government facilitated the entry of Gorkhas into the Brahmaputra Valley. The "versatile Nepalis" provided the much-needed labor force for a wide range of activities, including lumbering, forest clearance, domestic work, and policing. The Gorkhas were particularly drawn to Assam's vast open landscapes hills, dense forests, and extensive wastelands rich in green vegetation which created ideal conditions for cattle rearing (Chetry,2016). Consequently, the colonial economy in Northeast India played a significant role in the development of dairy farming in the region.Today, the Gorkha community continues to dominate the dairy sector in Assam. With an annual turnover of about 20 crores, Gorkha dairymen are the largest producers and suppliers of milk in the state, catering to nearly 80% of the region's population (Gurung, 2018).

The study of Traditional Ecological Knowledge (TEK) holds great relevance in today's sustainability context, as it provides perspectives that go beyond the limitations of purely technological or scientific approaches. While modern science offers valuable insights into ecological processes, it often lacks the long-term, place-based understanding that TEK embodies. Rooted in generations of lived experience, TEK emphasizes holistic environmental management by viewing ecosystems as interconnected rather than fragmented. It also highlights the resilience and adaptive strategies developed by indigenous communities to cope with climate variability, natural disasters, and resource scarcity knowledge that is increasingly crucial in the face of climate change. Moreover, TEK contributes to biodiversity conservation by preserving traditional crop and livestock varieties and by promoting sustainable harvesting and habitat protection. Its practices often minimize waste and pollution, offering alternatives to resource-intensive technologies. Thus, TEK complements scientific knowledge by fostering stewardship over exploitation and by providing time-tested, practical strategies for living within ecological limits, making it a vital component of contemnor.

Methodology: In order to investigate how Traditional Ecological Knowledge (TEK) has influenced the development of dairy among the Gorkha community in Assam, the current study uses a qualitative and descriptive research approach in conjunction with historical, analytical and descriptive methods. Books, journals, government reports, archival materials, and past research on Gorkha migration, cattle culture, and rural livelihood are the main secondary sources that form the basis of this study. Descriptive and analytical methods assisted in comprehending the current significance of indigenous dairy practices in sustainable resource management, while historical analysis traced the beginnings and development of the Gorkha settlement and their pastoral practices since the colonial era. The study focuses on Gorkha- inhabited areas, especially the riverine and foothill areas like Sonitpur, Dibrugarh, and Guwahati, where raising cattle is still a common occupation. To find patterns of ecological knowledge like rotational grazing, selective breeding, Ethno veterinarian medicine, and organic resource recycling, the gathered data was subjected to a thematic analysis. The study emphasizes how TEK-based dairy practices among the Gorkhas contribute to the socioeconomic development of Assam's rural landscape by tying cultural traditions with environmental sustainability.

i. Cattle Culture among the Gorkhas: Cattle farming has long been recognized as the principal and culturally inherited occupation of the Gorkha community in Assam. Historically, this group has played a

decisive role in shaping the dairy economy of the state. Before the advent of British rule, the Gorkhas were already the primary dairy farmers, and their knowledge of cattle rearing was deeply rooted in cultural traditions rather than commercial motives. Dairy farming, during that time, was largely associated with social and ritual practices, reflecting its cultural essence more than its economic value.The colonial period marked a turning point in the professionalization of cattle farming in Assam. With the expansion of the British military presence, the demand for milk to supply soldiers gave rise to organized dairy farming. The migration of Gorkhas into Assam following the Treaty of Segauli (1815–16) facilitated this transformation, as graziers and soldiers settled in the foothills, forest fringes, and other strategic locations. Over time, these settlements evolved into compact pockets of Gorkha communities, many of whom continued the practice of dairy farming alongside their military service. Ethnographic accounts reveal that the majority of Gorkha graziers were Jaisis, Upadhyay Brahmins, and Chettries of non-martial categories, while groups like Gurungs and Magars, traditionally recruited into the army, often adopted dairy farming after retirement (Sinha, 1990; Nath, 2006). Religious practices further reinforced the centrality of cattle in Gorkha culture. For instance, gifting cows to priests during funerary rituals was considered a sacred act, enabling the deceased's soul to cross the mythical river Baitarani. This practice not only sustained cattle ownership but also integrated livestock into the spiritual fabric of the community. During the post-independence era, government initiatives such as the Town Mil Supply Schemes in Guwahati, Jorhat, Tezpur, and Dibrugarh were largely located in regions with significant Gorkha habitation. This reflects the vital role played by the community in the early development of organized dairying in Assam. Even in contemporary times, Gorkhas remain central to Assam's dairy sector. In Guwahati and its surrounding foothill regions, well-educated Gorkha households manage large herds of milch cattle, maximizing income through ecologically adaptive practices such as free grazing on naturally available grasses and the use of cheap rice straw during lean winter months (Saikia, 2009; Deka, 2011).Thus, cattle culture among the Gorkhas is not merely an economic activity but a blend of tradition, livelihood, and ecological knowledge. It is a unique cultural identity shaped by historical migrations, colonial encounters, and indigenous practices that continue to underpin the dairy development of Assam.

ii. Traditional Ecological Knowledge (TEK) among the Gorkhas: The collective body of knowledge, customs, and inventions created by local people by intimate engagement with their natural surroundings and passed down through the generations is known as Traditional Ecological Knowledge (TEK). TEK is the foundation of cow culture among the Gorkhas of Assam and has been essential to the continuation of dairy farming ways long before modern techniques were introduced. Raising cattle is not only a business endeavor for the Gorkhas; it is a cultural custom entwined with spirituality, ecological adaptability, and local knowledge. The indigenous knowledge of Gorkha TEK on herd management and cattle breeding is one of its most important features. Animals have traditionally been chosen by farmers based on characteristics including milk production, illness resistance, and environmental adaptation. In order to ensure that both subsistence and market demands are satisfied, herds are carefully maintained to maintain a balance between milch cows, calves, and draught animals. Ecological knowledge is also seen in the management of feed and fodder. By utilizing the seasonally available grasses from foothills and marshes, adding inexpensive rice straw during dry winters, and incorporating agricultural by-products like oil cakes and bran, Gorkha dairy households make the most use of their natural resources. Their capacity to adjust to natural cycles is further demonstrated by free grazing and pastureland rotation. An further essential element of TEK is ethnoveterinary practices. Local plants and common household items like garlic, mustard oil, neem leaves, and turmeric are frequently used as remedies for cow illnesses. A comprehensive awareness of animal health is demonstrated by preventive measures including smoke to fend off insects, salt licks, and herbal baths. The gendered aspects of TEK are demonstrated by the crucial role that women, in particular, have had in conserving and sharing this information. The sustainable use of bovine byproducts is equally vital. For example, cow urine may be used as a natural insecticide and medication, and cow dung can be utilized as an organic fertilizer to improve soil fertility. In a circular economy, nothing from the livestock is wasted, as

shown by such behaviors. The importance of cattle in Gorkha culture is further supported by rituals and traditional beliefs. In addition to being a religious custom, giving cows as gifts at funeral ceremonies helps maintain cattle ownership in families. Festivals sometimes incorporate ceremonies focused on the maintenance of cattle, which are seen as emblems of wealth. These cultural standards connect ecological knowledge with spiritual beliefs by guaranteeing that cattle are treated with care and respect. The seasonal adaptations and habitation patterns of the Gorkha cattle culture demonstrate their ecological flexibility. Gorkhas have historically shown resilience in maintaining dairy production by selecting foothill regions with abundant grasses and water supplies, and by adjusting herd size or feeding practices based on seasonal availability. Since the community was able to control the dairy industry during both colonial and post-colonial times thanks to their resource-efficient, low-input practices, this ecological understanding has directly aided Assam's dairy growth.

iii. TEK and Dairy Development in Assam: As part of larger developmental processes, the integration of Traditional Ecological Knowledge (TEK) has greatly influenced the expansion of dairy farming in Assam. TEK has established the foundation for the modern organized dairy sector, even if it began as a survival tactic based on the ecological and cultural customs of the Gorkha people. It is significant not just for maintaining native customs but also for influencing market structures, legislative frameworks, and sustainable production techniques. A major contribution of TEK to dairy development is its emphasis on low-cost, adaptive practices that are particularly suited to Assam's ecological and socioeconomic context. Unlike resource-intensive scientific models of dairying that require heavy investment in infrastructure, feed, and technology, TEK-based systems rely on the intelligent use of naturally available resources. This adaptability has enabled even small and marginal dairy farmers to participate in milk production, thereby democratizing access to the dairy economy. In the absence of advanced infrastructure in Assam's rural and foothill regions, TEK offered a practical foundation upon which modern dairy initiatives could later be built. When it comes to implementing policies, TEK has been a bridge. Because TEK-based traditions had previously guaranteed a consistent milk supply, early government initiatives like the Town Milk Supply Programs were most effective in regions with a significant Gorkha population. This illustrates how state-led projects may be enhanced by indigenous systems. Even now, development organizations that promote dairy products frequently rely on the collaboration and wisdom of nearby Gorkha villages, acknowledging them as the keepers of useful information that contributes to the prosperity of self-help group businesses and cooperative dairies. The importance of TEK in dairy growth is even more apparent in light of the current ecological stress and climate change. The ideals of sustainable agriculture are aligned with practices like rotating grazing, reusing byproducts, and using organic fertilizers made from cow dung. They keep production costs down while preserving soil health and lowering carbon footprints. A hybrid paradigm that guarantees both ecological sustainability and economic growth is produced by combining historical practices with contemporary scientific interventions, such as better cow breeds, veterinary treatment, and cooperative marketing. Addition to maintaining the Gorkhas cattle- raising culture, TEK has made a direct contribution to the institutional, financial, and environmental aspects of Assamese dairy development. Achieving equitable and sustainable growth in the dairy industry requires acknowledging and incorporating this knowledge system into current policy.

Result: The research indicates that the Gorkha community in Assam remains a key player in the state's dairy industry, preserving both its economic significance and ecological sustainability. Secondary data suggests that approximately 80 percent of the milk available in Assam is produced and distributed by Gorkha dairy farmers. This prevalence underscores the community's ongoing role in the dairy economy, which is firmly established in their Traditional Ecological Knowledge (TEK).Gorkha dairy households continue to rely on locally available feed resources, such as wild grasses, rice straw, and agricultural by-products, there by minimizing dependence on expensive external inputs. The use of cow dung as an organic fertilizer and cow urine as a natural pest repellent is an example of sustainable, zero- waste livestock management. TEK remains a dynamic and living system, reflected in daily practices of cattle management, feeding, and disease

prevention. In order to ensure the inter-generational transfer of indigenous expertise, women are equally important in maintaining feeding schedules, herd management, and Etno veterinarian knowledge. The practice of giving cows as gifts during funeral rites and other cattle-centered customs like Gai Tihar support the continuation of cattle ownership and uphold the spiritual and cultural significance of animals. When combined, these methods give tiny and marginal Gorkha farmers economic stability, particularly in Assam's environmentally delicate foothill areas.

Discussion: The findings show the connection between the Gorkhas culture, way of life, and environmental sustainability through their Traditional Ecological Knowledge. Unlike modern, technologically sophisticated dairy systems, Gorkha dairying is an example of adaptive efficiency, a knowledge system shaped by decades of lived ecological experience. The colonial settlement of Nepali graziers in Assam historically enabled organized dairying; yet, the persistence of TEK indicates that industry has not supplanted indigenous practices, but rather that they coexist in a hybrid form. Many Gorkha farmers have adopted improved cow breeds, veterinary treatment, and cooperative selling arrangements while retaining their traditional grazing, feeding, and ethnoveterinary methods. An example of a strong adaptation that maintains ecological balance while boosting output is this hybridization. Furthermore, TEK's integration into Assam's dairy development initiatives, such as the Town Milk Supply Schemes, cooperative organizations, and self-help group projects, emphasizes its institutional importance. In regions with sizable Gorkha populations, where indigenous biological knowledge ensures a consistent supply of milk despite resource or climatic constraints, these programs have been particularly effective. The Sustainable Development Goals (SDGs) of the UN are very consistent with the Gorkha dairying strategy, particularly those related to gender equality (SDG 5), poverty reduction (SDG 1), and responsible production (SDG 12).With their low-input, circular economy methodology, they demonstrate how indigenous systems can serve as a useful framework for sustainable rural development. The study also demonstrates that TEK is a crucial resilience strategy against climate change and environmental deterioration. By focusing on resource recycling, organic fertilization, diverse fodder use, and rotational grazing, it reduces the stress on natural ecosystems. By preserving natural balance, ensuring economic self-reliance, and safeguarding local breeds, TEK offers a holistic model of sustainability from which modern scientific interventions can benefit. Assam's rural future depends on the survival of Gorkha TEK, which stands for both cultural preservation and an ecologically sound strategy.

Conclusion And Recommendations: The study confirms that the Gorkha community's dairy practices, deeply rooted in Traditional Ecological Knowledge, form a sustainable model of rural development in Assam. Their ecological adaptability, gender-inclusive knowledge systems, and low-cost, circular economy approach have significantly contributed to the stability and growth of the state's dairy sector. The coexistence of traditional and modern practices underscores the dynamic nature of TEK and its relevance in contemporary development paradigms. Policy frameworks must acknowledge and incorporate TEK into agricultural and rural development initiatives in order to achieve sustainable progress. Participatory research and community-based knowledge- sharing platforms should be used to record and conserve the ecological and ethnoveterinary practices of Gorkha dairy farmers. Furthermore, Gorkha women can be empowered as important TEK custodians by supporting gender-sensitive dairy initiatives. Last but not least, cooperation among local communities, academic institutions, and governmental organizations can guarantee that traditional knowledge systems keep up with contemporary technologies, promoting an Assamese dairy development path that is economically feasible, ecologically balanced, and culturally based.

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