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Assimilation of indigenous nomadic pastoralist knowledge in the Public Governance of Sámi Reindeer Husbandry

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This article examines how Norwegianization and subsequent governance reforms have reshaped Sámi reindeer herders' understandings of sustainable reindeer husbandry as a nomadic pastoral system operating under non-equilibrium Arctic conditions. While assimilation's effects on language and identity are well documented, its consequences for pastoral learning systems, household governance, and adaptive capacity remain less systematically analysed. Drawing on interdisciplinary research, policy documents, and testimonies to the Norwegian Truth and Reconciliation Commission, the article provides a thematic synthesis of how state rationalization, educational restructuring, and administrative standardization have reconfigured Sámi Indigenous pastoral knowledge. The analysis shows that assimilation operates through governance mechanisms that translate Sámi professional language, *siida*-based organization, gendered earmark rights, and place-based ecological knowledge into standardized administrative categories. Reforms introduced from the 1970s onward privileged equilibrium-oriented and production-based indicators, marginalizing flexible, mobility-centered pastoral logics. Over time, these governance transformations have interacted with globalization, infrastructural expansion, land fragmentation, and climate change, intensifying pressures on seasonal mobility, pasture access, and the annual cycle central to nomadic pastoral adaptation. These processes have weakened intergenerational knowledge transmission, narrowed learning arenas, and redefined land-use competence as regulatory compliance rather than adaptive navigation of variable socio-ecological systems. Under accelerating climate change and land-use fragmentation, the resilience of Sámi reindeer husbandry depends on restoring coherence between language, mobility, household-*siida* organization, and practice-based learning. The article argues that *seanadit*, reconciliation grounded in institutional and epistemic realignment, is a prerequisite for robust pastoral governance in the Circumpolar North.

KEYWORDS

assimilation, Sámi reindeer husbandry, indigenous nomadic pastoral knowledge, education, governance, knowledge transmission, resilience

Introduction

Indigenous pastoral societies worldwide have experienced profound transformations under colonial and assimilation policies. In Norway, the Sámi, the Indigenous people of northern Fennoscandia, were subjected to a long-term state assimilation process known as Norwegianization. The Norwegian Truth and Reconciliation Commission (TRC, 2023) defines Norwegianization as a systematic effort by state authorities to assimilate Sámi, Kven/Norwegian Finns, and Forest Finns into the dominant Norwegian culture. These policies targeted language, culture, land rights, education, identity, and traditional livelihoods, including reindeer husbandry. Measures included prohibiting minority languages in schools, promoting Norwegian settlement, regulating land ownership, and restructuring livelihoods.

Although frequently justified as modernization and national integration, such policies produced long-lasting cultural, social, and economic consequences. While the impacts of Norwegianization on language and identity have been widely documented, its effects on reindeer herders' understanding of sustainable Sámi reindeer husbandry, knowledge transmission in Indigenous pastoral learning and Indigenous knowledge systems remain less explored. This article addresses that gap by asking:

How have Norwegianization and subsequent governance reforms affected Sámi reindeer herders' conceptualizations of the production, transmission, and legitimacy of Sámi Indigenous pastoral knowledge across both institutional and practice-based learning systems essential for sustainable reindeer husbandry?

In mobile pastoral systems, sustainability is enacted through situational decisions: when to move herds between seasonal ranges, how to distribute grazing pressure across heterogeneous landscapes, how to balance herd composition between breeding females and slaughter animals, and how to buffer risk under stochastic events. In Sámi reindeer husbandry, such decisions rely on detailed assessment of snow stratigraphy, ground-ice formation, wind exposure, insect harassment, and pasture memory, as encoded in Sámi professional terminology and toponymy (Magga et al., 2011). Governance reforms that translate such situated judgement into fixed administrative dates, numerical ceilings, and standardized indicators therefore intervene directly in the adaptive mechanics of nomadic pastoralism.

In 2024, the Norwegian Parliament (Stortinget¹) formally acknowledged the harms caused by the Norwegianization policy and expressed its deepest regret for the abuses inflicted on the Sámi, Norwegian Finns, and Forest Finns. Through Resolution No. 15, the Parliament apologized for the active role of earlier state institutions and recognized responsibility for the long-term consequences of assimilation for individuals and communities.

Central to the work of the TRC (2023) was the understanding that reconciliation is not a single event, but a relational and multi-level process unfolding over time at individual, collective, and political levels. The Commission employed the Sámi concepts of *dáruiduhttin* - the historical process of Norwegianization and enforced assimilation - imposed by the state and the concept of

seanadit, meaning to adapt, become accustomed, or begin to thrive (Nielsen, 1979), as a guiding notion, emphasizing reconciliation as both a process and a state. While *dáruiduhttin* captures the structural transformation and marginalization of Sámi language, institutions, and knowledge systems through state policies, *seanadit* emphasizes restoration, continuity, and the rebuilding of relational balance. In this article, *seanadit* is used analytically to denote the conditions under which Sámi reindeer husbandry can regain coherence between knowledge, practice, governance, and social organization, thereby strengthening robustness under contemporary governance and climate pressures.

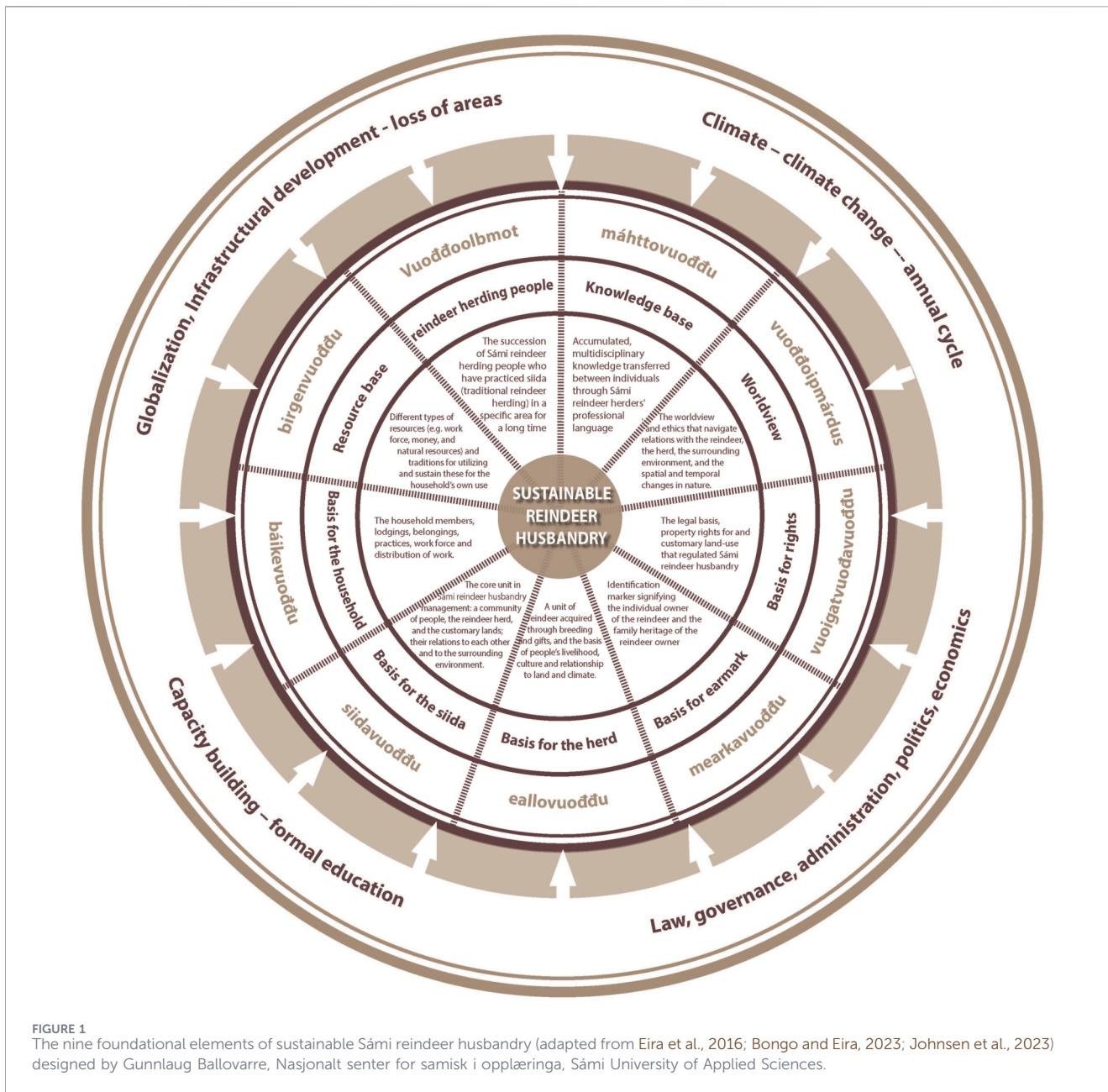
For Sámi reindeer husbandry, however, the consequences of *dáruiduhttin* or assimilation cannot be understood solely in terms of language loss or cultural suppression (TRC, 2023), but also in terms of the economy of the household. From the 1970s onward, reindeer husbandry in Norway was profoundly reshaped through state-led rationalization and modernization processes that transformed governance structures, production objectives, and management practices, often without incorporating Sámi reindeer herding knowledge (Johnsen et al., 2023; Mathiesen, 2023). Although reindeer husbandry continues to be practiced within Indigenous frameworks, it has increasingly been integrated into national meat production systems, introducing standardized management tools and production-oriented objectives that have altered the conditions under which Sámi knowledge is practiced, transmitted, and valued (Eira R, 2012; Sara and Forthcoming, 2026).

Recent discussions in science policy have highlighted that scientific knowledge alone cannot fully capture the realities of human existence and social interaction. Science serves multiple purposes, yet these are always embedded in contextually constrained realities that require complementary forms of understanding, including professional, experiential, and Indigenous knowledge systems (Berkes, 2017; Kaiser and Gluckman, 2025). In the context of Sámi reindeer husbandry, Indigenous knowledge refers to cumulative, place-based systems of knowing developed through long-term interaction between humans, animals, and environments, and transmitted through Sámi language, social relations, and everyday practice (Arctic Council, 2015; Berkes, 2017).

Reindeer husbandry in Norway is characterized by a predominantly nomadic form of Sámi reindeer herding, involving extensive seasonal migrations between coastal, inland, and upland grazing areas (Tyler et al., 2007). This contrasts with more stationary forms of reindeer husbandry, characterized by shorter migration distances, which are more typical of parts of Finland (Magga-Eira, 2025) and some southern Sámi areas. Despite this distinction, the contemporary management model and legal framework governing Sámi reindeer husbandry in Norway were largely developed and 'modernized' based on knowledge systems, administrative practices, and governance assumptions derived from more stationary herding systems. At the time, Sámi reindeer husbandry was frequently framed by state authorities as inefficient and economically underperforming, providing justification for modernization interventions despite their long-term implications for governance autonomy and knowledge transmission (Johnsen et al., 2023).

Nevertheless, governance reforms in Norway, and in parallel in Finland and Sweden, have largely been based on equilibrium-

1 <https://www.stortinget.no/no/Stortinget-og-demokratiet/Organene/sannhets-og-forsningskommisjonen>.



oriented models that prioritize standardization, predictability, and administrative oversight, often at the expense of Indigenous nomadic pastoral knowledge (Turi, 2016; Johnsen et al., 2023; Beach, 1981). Such dynamics raise fundamental questions about sustainability, resilience, and knowledge pluralism in Arctic pastoral systems (Mathiesen, 2023; Tonkopeeva et al., 2024).

Against this background, this article presents an integrative thematic synthesis of interdisciplinary research, historical analyses, policy documents, and Indigenous-authored scholarship to examine how state-led assimilation and modernization policies have reshaped Sámi reindeer husbandry and Indigenous nomadic pastoral knowledge. Drawing on literature from pastoralism studies, anthropology, Indigenous studies, education research, and

environmental governance, as well as public documents such as Norwegian White Papers, legislation, and the TRC (2023), the analysis identifies recurring patterns in how Indigenous knowledge has been framed, marginalized, or selectively incorporated within governance reforms and reindeer herding learning systems. The primary empirical focus is Norway, where assimilation processes and governance transformations are extensively documented. The TRC (2023) collected 766 personal testimonies through interviews, written submissions, and public meetings. As Rasmussen's (2025) secondary analysis of the Commission's metadata shows, the material is demographically skewed toward older participants and women, with a clear predominance of Sámi contributors. While the material cannot be treated as statistically representative, it provides a substantial



FIGURE 2
Former parliamentary representative Margit Hansen Krone and Sámi reindeer herder Karen Anna Logje Gaup. The image illustrates the role of Sámi women in resisting governance interventions during the 1978 Reindeer Herding Act. Their accounts highlight how women's ownership rights were central to household organization, knowledge transmission, and the sustainability of Sámi reindeer husbandry. Photo: Svein Disch Mathiesen.

qualitative archive of lived experiences of Norwegianization, including 307 testimonies addressing reindeer husbandry and 275 concerning governance and administration. Examples from Finland and Sweden are included selectively to illustrate parallel dynamics and broader Nordic governance trends, but the article does not present a comparative country-by-country analysis. Instead, it adopts a thematic structure that examines key domains where governance reforms intersect with Indigenous knowledge systems, including mobility, herd management, reindeer herding learning systems, resource use, and material culture.

Informed by a perspective of knowledge pluralism, the article treats Indigenous knowledge of reindeer herders as an analytically distinct and epistemically valid form of knowledge production. Through this approach, the article contributes to debates in pastoralism research on sustainability, resilience, and governance by clarifying how competing knowledge systems shape the conditions for practicing and transmitting nomadic pastoralism under accelerating climate and land-use pressures.

Indigenous nomadic pastoral knowledge and mobility (*johtin*)

Pastoralism is commonly defined as a livelihood based on domesticated or semi-domesticated animals that graze predominantly on rangelands and involve varying degrees of mobility (Food and Agriculture Organization of the United Nations, 2026). Sámi reindeer husbandry is an Indigenous form of nomadic pastoralism in which mobility, *johtin* in North Sámi, is not merely movement across space, but a fundamental principle of knowledge, governance, and ecological adaptation. Mobility structures how herders respond to snow and ice conditions, seasonal transitions, insect pressure, pasture availability, and climatic variability. It is through coordinated movement that reindeer, people, and landscapes are held in dynamic balance. Reindeer herders themselves have emphasized that adaptation to climate change depends on maintaining mobility, herd diversity, and intergenerational knowledge transmission, rather than increasing technical control (Magga et al., 2011).

To conceptualize sustainability within this system, this article applies the analytical framework developed by Eira et al. (2016) which understands sustainable Sámi reindeer husbandry as a holistic model system composed of nine interrelated foundations: people (*vuodoolbmot*), *siida* (*siidavuoddu*), herd (*eallovuoddu*), *earmark* (*mearkavuoddu*), rights (*vuogatvuohtavuoddu*), worldview (*vuoddoipmárdus*), knowledge (*máhtovuoddu*), resource base (*birgenvuoddu*), and household (*báikevuoddu*) (Figure 1). Together these elements form an integrated governance and knowledge system grounded in lived pastoral practice. While the *siida*² coordinates seasonal mobility and collective decision-making, sustainability emerges from the interaction between social continuity, herd composition, land use, ethical orientations, and adaptive resource management (Eira, et al., 2016).

While this article applies an Indigenous understanding of sustainability as a holistic and relational system grounded in lived pastoral practice, it is important to recognize that sustainability in state governance contexts often functions as a managerial concept associated with standardization, production targets, regulation, and control (Johnsen et al., 2023). This distinction is important for understanding how different meanings of sustainability coexist and interact in Sámi reindeer husbandry.

In this analysis, particular emphasis is placed on *vuodoolbmot* (people), *báikevuoddu* (household), and *birgenvuoddu* (resource base) as key foundations through which Indigenous reindeer herders' knowledge is reproduced across generations.

Central to this knowledge system is a highly specialized Sámi professional language. This terminology encodes for example fine-grained distinctions concerning reindeer behavior and condition, snow and ice structures, weather dynamics, seasonal timing, and landscape features (Eira I., 2012; Eira et al., 2023). Such language is not merely descriptive; it constitutes an epistemic infrastructure through which knowledge is generated, assessed, and transmitted in practice. Precision in language enables herders to evaluate risk,

² *Siida* is a foundational, traditional Sámi organization of reindeer-herding families that collectively manage grazing lands and resources.

coordinate movement, negotiate responsibilities within the *siida*, and make decisions concerning herd composition and resource use. Knowledge is thus embedded in action and doing and articulated through everyday work, shared reflection, and intergenerational instruction.

Indigenous nomadic pastoral knowledge emerges through sustained interaction between herders, reindeer, and highly variable environments. It is relational rather than abstract, developing through embodied practice across seasonal cycles and snow-covered landscapes. Reindeer are understood as *boazu*, semi-autonomous beings that largely follow their own behavioral patterns and ecological rhythms (Eira et al., 2016; Sara, 2013). Herders therefore do not exercise total control but facilitate, protect, and adjust in response to the animals' movements and needs. Decision-making unfolds through continuous negotiation between ecological signals, herd behavior, and social obligations at the levels of individual owner, household, and *siida* (Sara, 2013). Knowledge is accumulated and refined across generations, but it is also continually tested and adapted through practice in ways comparable to empirical learning processes.

Within this framework, *birgenvuoddu* (resource base) is linked to *báikevuoddu* (household) as the primary arena in which knowledge is practiced, reproduced, and transmitted. The household functions not only as a unit of subsistence and economic activity, but also as a rights-bearing entity in the use of land-based resources connected to reindeer husbandry. More fundamentally, it serves as the central site of learning: it organizes labor, distributes responsibilities, makes economic and strategic decisions, and ensures the family's security and welfare. Through participation in everyday tasks, herding, slaughtering, processing, seasonal preparations, and coordination within the *siida*, knowledge is embodied and refined. Learning occurs through doing, observing, and gradually assuming responsibility, rather than through formal instruction alone.

A central principle in this system is intergenerational transfer. Traditionally, inheritance has involved a dual transmission: on the one hand, the transfer of knowledge and skills necessary to perform general and gendered tasks within the household and the *siida*; on the other hand, the transfer of material foundations is required to establish an independent livelihood. Competence and material resources are mutually dependent; without knowledge one cannot sustain a herd, and without a material base, one cannot practice and develop knowledge. Responsibilities for knowledge transmission are distributed across parents and close relatives, the household as a collective unit, and the *siida* community, depending on how tasks and roles are organized. This reflects the broader concept of *máhtovuoddu*, the knowledge base accumulated and passed down across generations through active participation across multiple arenas, family, household, *siida* cooperation, inter-*siida* encounters, and engagement with the wider society. Reindeer herding knowledge is therefore not an individual possession, but a collectively sustained system rooted in *vuoddoolbmot*, the continuity of *siida*-based people who carry forward both the epistemic and material foundations of the livelihood.

Within this system, the household (*báikevuoddu*) serves as the primary unit for operations and reproduction. It organizes labor, assets, seasonal tasks, and strategic decisions regarding slaughter, subsistence, income generation, and herd maintenance. The

household is also the central arena for knowledge transmission and socialization of younger generations into pastoral responsibilities. Closely linked is the resource base (*birgenvuoddu*), which encompasses diversified use of reindeer and other land-based resources for food, clothing, equipment, and income. The concept derives from *birget*, to manage, to cope, to sustain oneself, and emphasizes adaptive capacity rather than maximization of output. Resource use must be carefully timed within the annual herding cycle and coordinated with *siida* obligations. Sustainability, in this sense, depends on maintaining flexibility, diversity in herd composition, and access to varied seasonal pastures.

This epistemological and organizational framework differs fundamentally from state-based management models that prioritize standardized indicators, fixed herd numbers, and production targets. Whereas Norwegian governance increasingly defines sustainability in quantitative and technocratic terms (Johnsen et al., 2023), Sámi reindeer husbandry operates within a dynamic socio-ecological system characterized by variability, uncertainty, and relational responsibility. Mobility (*johtin*), linguistic precision, household organization, and adaptive resources, used together, constitute a living system of knowledge and governance that cannot be reduced to linear models of control. The tension between these epistemological premises and contemporary regulatory regimes forms the backdrop for the analyses that follow.

State rationalization and competing models of reindeer husbandry

Reindeer husbandry governance in Norway has been shaped by a persistent tension between Indigenous nomadic pastoral systems and state-led models of rationalization and modernization (Johnsen et al., 2017). A fundamental distinction exists between nomadic Sámi reindeer herding, based on long seasonal migrations across heterogeneous landscapes, and more stationary forms of herding characterized by shorter movements and localized pasture use. While nomadic reindeer herding dominates in northern Sámi areas, state management models and legal frameworks were largely developed and “modernized” on the basis of stationary herding practices, particularly from southern Sámi regions. (Mathiesen et al., 2024). This structural mismatch between governance models and pastoral realities has had long-lasting consequences for herd management, knowledge recognition, and self-organization (Turi, 2016; Johnsen et al., 2015).

The expansion of state control over reindeer husbandry predates the rationalization reforms of the 1970s (Johnsen et al., 2015). TRC (2023) documents how legal and administrative steps taken long before the 1970s gradually expanded state authority over Sámi reindeer husbandry. Preparatory work for the 1933 Reindeer Husbandry Act (Norwegian Ministry of Agriculture, 1932), building on the 1897 *Lappekomisjon*, framed reindeer husbandry as an activity that should minimally constrain agriculture. The 1933 Act strengthened surveillance through mandatory reporting, enabled the setting of maximum herd sizes, and allowed state-initiated reindeer counts. The Commission highlights how the *lappfogd's* (regional director of Reindeer

husbandry) dual role, combined with administrative authority, produce enduring asymmetries of power reinforced by linguistic and cultural dominance in state institutions.

Research shows that the 1970s reindeer husbandry reforms institutionalized a herd-number–driven management model in which traditional Sámi knowledge was not incorporated into governance structures (Official Norwegian Report, 2024; Degteva et al., 2024; Turi, 2016).

From the late 1960s through the 1970s, reindeer husbandry reforms in Norway and Finland were driven by concerns that Sámi reindeer husbandry was economically inefficient and that herders were lagging behind other occupational groups in income growth. These concerns underpinned political objectives of rationalization, articulated in official reports and white papers that aimed to reduce herd sizes while increasing productivity through standardized management practices (Norwegian White Paper, 1972). Similar logics informed reforms in Finland, where centralized planning and scientific management were promoted as pathways to efficiency and predictability (Sámi Truth and Reconciliation Commission in Finland, 2025).

Neither the 1976 Norwegian Reindeer Herding Agreement nor the 1978 Reindeer Herding Act was formally framed as instruments of Norwegianization. However, as acknowledged by the Stortinget (2024), assimilation may nonetheless result from laws pursued for other purposes that, in practice, erode Sámi language, culture, and knowledge. While earlier Norwegianization policies were explicit, later reindeer husbandry reforms produced comparable effects through governance and administrative rationalization.

Central to these reforms was the introduction of equilibrium-oriented management tools that prioritized numerical indicators such as herd size, slaughter rates, and carcass weights (Benjaminsen et al., 2016). Such tools reflected a production-oriented understanding of sustainability, emphasizing control, stability, and administrative oversight. Sustainability was thus operationalized through measurable outputs and statistical indicators rather than through adaptive mobility, herd diversity, and situational judgement. Similar findings are documented in participatory research from West Finnmark, showing how state policies since the late 1970s have promoted Western production-oriented management techniques that marginalize herders' context-dependent knowledge and flexibility under variable climatic conditions (Johnsen et al., 2017; Eira R, 2012). A recurrent justification for herd reduction in Finnmark has been the portrayal of grazing lands as an unregulated common, invoking Hardin's "tragedy of the commons" to suggest that individual incentives inevitably undermine collective sustainability. However, Marin and Bjørklund (2016) demonstrate that this narrative gained political influence despite its poor fit with siida-based customary regulation, negotiated access, and context-dependent decision-making in a highly variable rangeland system (Sara, 2013). The Truth and Reconciliation Commission further documents how governance reforms built on this framing formalized administrative districts and "common pastures" without corresponding mechanisms for managing internal use, thereby weakening traditional siida-based governance rather than strengthening collective responsibility (Marin and Bjørklund, 2016).

The systematic privileging of standardized indicators over Indigenous herd management practices represents a broader

process of knowledge displacement (Buljo, 2025). By defining what counts as relevant knowledge through statistics and administrative categories, governance reforms effectively downgraded Sámi reindeer herding knowledge and constrained alternative management strategies. Comparable dynamics have been documented in Swedish reindeer husbandry, where state-defined indicators and production models displaced Sámi practices and contributed to increased vulnerability under changing environmental conditions (Beach, 1981).

Across national contexts, governance reforms that privilege standardized indicators over Indigenous practices have narrowed the range of acceptable pastoral strategies and constrained self-organization. Research on social-ecological systems demonstrates that self-organization is a foundational condition for resilience to climate change and biodiversity loss (Huitric et al., 2016; van Rooij et al., 2023). By marginalizing *siida*-based autonomy, state-led rationalization has contributed to increased vulnerability, particularly in regions with long migration routes and high environmental variability.

Taken together, these reforms illustrate how assimilation-driven rationalization reshaped reindeer husbandry by privileging stationary, production-oriented models over nomadic pastoral logics. In doing so, governance not only altered technical practices but redefined sustainability, efficiency, and legitimacy in ways that disadvantaged Indigenous nomadic pastoral knowledge (Benjaminsen et al., 2016).

Under contemporary climate and land-use pressures, restoring robustness in Sámi reindeer husbandry requires *seanadit*: the re-establishment of coherence between knowledge, practice, mobility, and self-organization. The implications of these dynamics for learning, knowledge transmission, and education are examined in the following section.

Learning by herding and the restructuring of knowledge transmission

Learning by herding is understood as a lifelong, practice-based, and relational learning system in which Sámi reindeer herding knowledge is transmitted through participation in real work tasks within the *siida* and household. Knowledge develops progressively through observation, guided participation, repetition, specialized language use, and increasing responsibility across age-based learning levels. It integrates ecological observation, ethical orientation, social organization (*siiddastallan*), and professional terminology into a holistic knowledge system embedded in the annual cycle (Bongo and Eira, 2023). Learning by herding constitutes the primary mode of acquiring traditional knowledge within reindeer herding environments, grounded in participation, responsibility, and seasonal practice. When access to such embedded learning arenas is reduced, new arenas must be deliberately constructed to sustain knowledge transmission (Bergström, 2001).

Similar principles structure other Sámi knowledge practices, including learning by *duodji*, where skills and judgment are acquired through participation and gradual responsibility. In this sense, learning by herding reflects a broader Indigenous epistemology

grounded in embodied practice rather than abstract instruction (Triumpf, 2011).

Accounts of “teaching by living” further illustrate how Sámi knowledge is transmitted through embodied participation in land-based practices. Learning occurs while walking, observing, cutting, preparing food, and listening to stories, where children are gradually introduced to seasonal timing, species selection, ecological limits, and ethical relations to nature. Knowledge is not separated into discrete subjects but emerges through responsibility-taking within the household and landscape. Such learning integrates technical skill, moral conduct, and environmental perception, forming a relational understanding of humans as part of, rather than master’s over, nature. When access to these practice arenas is reduced or displaced by institutional structures detached from seasonal cycles and mobility, the intergenerational reproduction of Indigenous nomadic pastoral knowledge is weakened (Triumpf, 2011; Triumpf, 2004).

TRC (2023) identifies revitalization of traditional knowledge in educational systems as a central component of reconciliation. This underscores the necessity for pedagogical approaches that recognize Indigenous knowledge not merely as cultural content to be appended to existing curricula, but as a living, practice-based system; what Mikkel Nils Sara terms *nammijadieđut ja - máhtut* (self-evident, essential knowledge) (Sara, 2003). To operationalize this, research suggests a shift toward transdisciplinary didactics (Bongo, 2005; Bongo, 2026), in which the *siida* is recognized as a primary learning arena.

By integrating education directly into the seasonal cycles and daily work of reindeer husbandry, schooling could move beyond majoritarian institutional logics and enable a genuine synthesis between practice-based Indigenous knowledge and formal education. This would require recognizing Sámi reindeer herding knowledge as a living, relational, and adaptive system embedded in *siida* organization, language, and the annual cycle, rather than reducing it to cultural content added onto standardized curricula.

From the late 1960s onwards, the Norwegian education system’s institutional expansion increasingly encompassed Sámi reindeer herding communities. The establishment of the first Sámi kindergarten in 1969 marked an early attempt to provide early childhood education within Sápmi (Gaup, 2008; Storjord, 2005). However, many reindeer-herding parents were sceptical about sending their children to the kindergarten. The institutions were perceived as culturally and linguistically foreign, organised around Norwegian pedagogical norms and detached from the seasonal rhythms and work-based learning central to *siida* life.

Compulsory primary and secondary schooling further integrated reindeer herding children into the national education system. While schooling provided access to formal qualifications and broader societal participation, it also removed children from everyday herding practices during formative learning years. For many families, this created a structural tension between state-defined educational obligations and the intergenerational transmission of Indigenous knowledge. Compulsory schooling reorganizes children’s time in ways that structurally limit participation in *siida*-based seasonal practices.

Archival material from *Finnmark Dagblad* (26 March 1966) shows that Kautokeino Flyttsamslag proposed the establishment of a voluntary reindeer husbandry track within the nine-year

compulsory school. Crucially, the resolution emphasized that active reindeer herding parents should participate in the development of the curriculum. This initiative demonstrates that reindeer herding parents did not reject schooling *per se*; rather, they called for an education adapted to the realities of reindeer herding children. The demand for parental involvement and for a reindeer husbandry line within the compulsory system reflects an early articulation of the need to align formal education with *siida*-based life, seasonal mobility, and Indigenous knowledge transmission.

Until the late 1960s, Sámi reindeer husbandry knowledge was transmitted almost exclusively through participation in family and *siida*-based practices, where children learned through observation, responsibility, and guided involvement in real herding situations (Norwegian Official Report, 1975; Höem et al., 1994; Höem, 1996; Bergland, 1998). Learning was embedded in everyday work and constituted a holistic, lifelong system closely linked to language, landscape, and social relations, consistent with Indigenous learning models grounded in participation in living communities (Cajete, 1994).

The gradual introduction of formal education in reindeer husbandry was driven by modernization agendas that framed traditional learning as insufficient for emerging economic and administrative demands (Norwegian Official Report, 1975). Vocational training was expected to promote rationalization, professionalization, and productivity, aligning reindeer husbandry with national education and management systems.

Schools occupy a central position in society, functioning both as instruments of social reproduction and as arenas for shaping future citizens. This reciprocal relationship applies equally to Sámi communities (Eira, 2013). The absence of explicit references to reindeer husbandry and reindeer herding knowledge in the national curriculum frameworks for primary, lower secondary, and early childhood education illustrates how Norwegianization persists in institutional form. Reindeer husbandry is mentioned only in the upper secondary vocational programme. At the same time, Sámi traditional knowledge is largely confined to the subject of Sámi as a first language (Norwegian Directorate for Education and Training, 2020a; Norwegian Directorate for Education and Training, 2020b) and the framework plan for Sámi kindergartens. Consequently, the epistemic foundations of Sámi reindeer herding knowledge remain structurally peripheral within mainstream education, reproducing asymmetries in whose knowledge counts as general, foundational, and nationally relevant.

Knowledge transmission is not only a matter of preserving cultural heritage but is central to adaptive capacity under climate change and land-use pressures. When education systems fail to support Indigenous ways of knowing, languages, and land-based learning, they contribute to a narrowing of pastoral strategies and a reduction in the capacity for self-organization (Mathiesen et al., 2018). Conversely, locally grounded, holistic, and multidisciplinary educational models that engage directly with herding practice, intergenerational learning, and Sámi language can play a key role in sustaining Indigenous nomadic pastoral knowledge and strengthening socio-ecological resilience in reindeer husbandry systems.

In response to modernization agendas and growing state recognition of the need for vocational competence, reindeer

BOX 1 Sámi women's resistance during the 1978 Reindeer Herding Act.

During interviews conducted in 2022, former parliamentary representative Margit Hansen Krone and Sámi reindeer herder Karen Anna Logje Gaup reflected on the legislative process leading up to the 1978 Norwegian Reindeer Herding Act and the proposed removal of Sámi women's independent reindeer earmarks.

Hansen Krone recalled immediately recognizing that the proposal conflicted with Sámi customary property relations: "Sámi women had earned a right that was not legally established. When a Sámi woman married, she brought her reindeer into the marriage, and no one could take the yield." The proposal sought to abolish this practice precisely because it was not codified in Norwegian law.

From the perspective of reindeer husbandry practice, Gaup warned that the consequences would be existential: "The whole industry will die out if Sámi women don't have the right to own reindeer."

husbandry courses were established at the upper secondary level in Guovdageaidnu and Kárásjohka, culminating in the creation of the State Reindeer Husbandry School in 1968. Although these initiatives aimed to strengthen professional and administrative competence within the industry and support young people's broader participation in society, the curriculum was largely modelled on agricultural education frameworks developed for sedentary farming systems. This introduced standardized and production-oriented educational logics into a livelihood structured around mobility, seasonal variability, and situational judgment, creating a structural tension between institutional schooling and the flexible learning processes characteristic of nomadic pastoralism. Similar dynamics can be observed in Finland, where formal training and advisory systems increasingly emphasized scientific management, feeding regimes, and productivity indicators, often at the expense of local and practice-based knowledge (Magga-Eira, 2025).

This epistemic misalignment was identified already at the formative stage of institutional reform. Sámi representatives warned that institutionalizing reindeer husbandry education within mainstream agricultural frameworks risked marginalizing Indigenous knowledge systems and governance principles. Mikkel Aslak Eira, representing the Sámi minority in the NOU committee, argued that reindeer husbandry, given its distinct social, ecological, and cultural foundations, required separate organizational forms and educational structures rooted in Sámi institutions and central Sámi areas (Norwegian Official Report, 1975).

Subsequent research confirms that Sámi traditional knowledge operates as a situated (Lave and Wenger, 1991), practice-based learning system characterized by orality, flexibility, and accountability within the *siida* (Höem, 1996; Keskitalo, 2009; Balto, 2023). Studies of reindeer husbandry education demonstrate that traditional knowledge transmission depends on lifelong participation, relational responsibility, and intergenerational engagement. In contrast school-based education is structured around linear curricula, age-segregated progression, and abstract knowledge categories (Bongo and Eira, 2023). As a result, formal schooling tends to fragment knowledge that is traditionally integrated and relocates learning away from the contexts in which adaptive decisions are made under environmental variability.

These tensions are further intensified by assimilation processes that have historically positioned schools as instruments of cultural and linguistic transformation (Minde, 2005).

Recent truth and reconciliation processes have acknowledged historical injustices; there remains limited systematic understanding of how governance reforms are experienced and negotiated within contemporary pastoral education. Further research is needed to examine how Sámi knowledge systems can be supported within

educational and vocational institutions on their own epistemic terms, thereby strengthening Indigenous self-determination and long-term pastoral sustainability.

Reindeer herders' language, knowledge, and everyday practices past and present

Sámi reindeer husbandry has traditionally been organized as a family-based economy in which knowledge, labor, and ownership are distributed across genders (Eira et al., 2016; Johnsen et al., 2023; Bongo and Eira, 2023; Meløy Utsi, 2010).

Women's rights to hold independent earmarks were central to this structure, underpinning both economic autonomy and intergenerational knowledge transmission (Wiig, 1984; Ulvevadet and Klokov, 2004). The 1978 Reindeer Herding Act introduced a licensing system requiring formal operating units. In practice, licenses and subsidies were largely allocated to male household representatives, weakening women's ownership rights and contributing to their declining participation in reindeer husbandry (Riseth, 2000). Although a compromise institutionalized joint earmarks for spouses, separate earmarks were framed as exceptions rather than rights, and children's earmarking practices were excluded from the legal text (Wiig, 1984). These reforms not only altered gender relations but also jeopardized the social and economic foundations of the pastoral system, illustrating how assimilation may operate through governance measures that impose external property and family models without being explicitly framed as Norwegianization (Wiig, 1984; Ulvevadet and Klokov, 2004; Riseth, 2000). These governance interventions must be understood against the background of a household- and *siida*-based knowledge system. Women and men traditionally held complementary and largely autonomous roles, and knowledge transmission was broadly gender-inclusive, with children learning through participation in everyday work rather than through formally segmented tasks (Eira et al., 2016; Bongo and Eira, 2023; Nergård, 2022; Balto, 1997). Women's rights to own reindeer and hold individual earmarks were central to this system, securing both economic autonomy and intergenerational knowledge transfer within family-based pastoral economies (Wiig, 1984; Ulvevadet and Klokov, 2004). However, Norwegian authorities in the mid-twentieth century interpreted Sámi social organization through external property and family norms, overlooking women's independent legal and economic standing in reindeer husbandry.

Indigenous knowledge transmission in reindeer husbandry integrates technical skills, ecological understanding, ethical

norms, and social organization, and is inseparable from the Sámi language and everyday engagement with reindeer and landscapes (Bongo and Eira, 2023; Magga-Eira, 2025). The Commission report shows that governance interventions affect knowledge transmission not only through schooling but also by altering access to key arenas of practice. For example, earmarking and the “*merkegerdet*” function as social learning arenas where children acquire knowledge about individual animals, qualitative assessment, and social relations embedded in ownership and *siida* cooperation. When legal changes restrict earmark rights or exclude certain holders (including through licensing systems), the effects extend beyond formal rights: intergenerational knowledge transfer can be weakened because the practical conditions for learning are disrupted.

Assimilation in Sámi reindeer herding is not only a thing of the past. Today, it primarily operates through everyday governance practices. Rather than explicit prohibitions, contemporary assimilation unfolds through administrative routines, regulatory language, and standardized management tools that reshape how Indigenous reindeer herders’ knowledge can be expressed, recognized, and enacted. Assimilation thus operates through *governance translations*, whereby Indigenous categories, responsibilities, and evaluative criteria are re-coded into majority-language administration, metrics, and institutional procedures.

This section examines how such processes affect gendered rights, professional language use, land-use understanding, and *duodji*³, drawing on documents from Norway and on testimonies presented by reindeer herders to the TRC. Gender distribution in Sámi reindeer husbandry is formally gender-neutral, with women and men cooperating in all central tasks (Bongo and Eira, 2023) including herding, earmarking, migration, and slaughtering, knowledge transmission, professional language use (Eira I., 2012; Buljo, 2025; Eira K. I., 2025; Sara and Eira, 2021), land-use understanding (Magga-Eira, 2025), food sovereignty (Sara and Mathiesen, 2020), *duodji* production (Triumpf, 2011). Although a traditional division of labor exists to some extent, tasks remain flexible and depend on the composition of the household and the *siida*. Knowledge transfer is likewise gender-neutral, as girls and boys learn the full range of skills necessary for daily operations and livelihood.

Women’s ownership of reindeer

During the legislative process preceding the 1978 Reindeer Herding Act, proposals were put forward to restrict rights to earmark a single holder per household, typically the male representative (Proposition No. 9 to the Odelsting, 1976). Although later modified, these proposals reveal how state authorities conceptualised reindeer ownership through external property norms that failed to recognize women’s independent legal and economic standing within Sámi pastoral society. Reindeer earmarks are not merely technical identifiers; they constitute a juridical and social infrastructure through which ownership, responsibility, kinship ties, and professional language

are transmitted across generations. Intervening in earmark structures therefore affects more than property distribution, it reshapes the social conditions under which knowledge, identity, and authority are reproduced within the *siida*.

Sámi women, supported by a former parliamentary representative Margit Hansen Krone, successfully resisted the most far-reaching restrictions, arguing that abolishing women’s ownership would fundamentally alter gender relations and threaten the viability of reindeer husbandry as an Indigenous livelihood (Figure 2, Box 1); nevertheless, gender-differentiated access to ownership persists, with ongoing consequences for knowledge transmission and sustainability.

Their combined arguments grounded in both political insight and everyday pastoral practice, were decisive in halting the most far-reaching elements of the proposal. The case illustrates how Sámi women situated knowledge, and political agency disrupted an assimilationist governance process, even as gender equality in reindeer ownership remains incomplete.

Strong mobilization by Sámi women, particularly in Guovdageaidnu and Kárásjohka, combined with parliamentary intervention, halted the most far-reaching elements of the proposal, original suggested by a Southern Sámi veterinary through lobby The eventual compromise permitted women to retain earmarks within their husbands’ operational units. While this prevented full dispossession, gender-differentiated access to ownership persists, with continuing implications for autonomy, knowledge transmission, and sustainability.

Women have always been *vuoddoolbmot* (people/core members) of the *siida* on an equal footing with men (Eira et al., 2016; Johnsen et al., 2023). However, through assimilationist policies, the state attempted to curtail its role by removing its rights to reindeer and thus to reindeer husbandry by deleting the earmarks of women and children. The 1978 Act was drafted without adequately incorporating reindeer herders’ perspectives. In reindeer husbandry, women’s position, rights, and knowledge differ fundamentally from those in agriculture, where ownership is typically concentrated in a single individual. Sámi reindeer-herding women have historically established their own rights, autonomy, and knowledge. Their ownership rights were grounded in customary practice rather than formal law, and the proposed removal of these rights would have fundamentally reshaped gender relations and threatened reindeer husbandry as a viable Indigenous livelihood. This case illustrates how assimilation may operate not only through overt prohibition but through attempts to redefine household governance structures in ways misaligned with Indigenous pastoral organization. The same restructuring occurs in the linguistic domain: by marginalizing Sámi as a governance language, the state reshapes the epistemic framework within which pastoral knowledge can be articulated and recognized.

Marginalization of reindeer herding professional language and place-based knowledge

Reindeer herding professional language constitutes a core component of Indigenous nomadic pastoral knowledge and practice. It encodes detailed distinctions concerning all foundational elements of sustainable reindeer husbandry, including people, *siida* organization, herd composition, earmarking systems, rights structures, worldview, knowledge

³ *Duodji* is the Sámi system of traditional craft, material knowledge, and aesthetic practice.

transmission, resource use, and household governance, thereby functioning as the linguistic infrastructure through which sustainability is understood, enacted, and reproduced across generations. In Troms and Finnmark, Sámi remains the primary working language in everyday herding practice (Eira, N. I, 2011; Eira I., 2012; Sara and Eira, 2021; Eira et al., 2023; Eira I. M. G. et al., 2025; Magga-Eira, 2025).

However, governance frameworks in Norway predominantly operate in majority languages. The Truth and Reconciliation Commission documents how administrative correspondence, reduction orders, and subsidy criteria written in Norwegian often fail to align with Sámi understandings of proportionality, collective responsibility, and *siida*-based governance (TRC, 2023). When key Sámi concepts lack equivalents in majority languages, knowledge is translated into administrative categories that distort its relational and adaptive meaning.

The state's choice of state language in matters concerning reindeer husbandry (TRC, 2023) has had a significant impact on the language used in the daily work with reindeer (Magga-Eira, 2025), thereby eroding Sámi knowledge and language use. Magga-Eira (2025) provides empirical examples from both Norway and Finland demonstrating that this process is ongoing. In districts such as Sálevárri in Anár, Sámi place names remain central in everyday herding practice. At the same time Finnish dominates official mapping and documentation, creating a bilingual governance context that privileges majority-language forms.

This shift, reinforced by assimilationist schooling and administrative routines, has weakened Sámi linguistic competence among younger herders and contributed to hybrid toponyms that erode ecological knowledge embedded in landscape terminology (Magga-Eira, 2025). At the same time, zoning systems, fixed migration dates, and quantitative carrying-capacity models marginalize relational and variability-oriented land-use knowledge, weakening *siida*-based governance (Näkkäljärvi and Juntunen, 2024; TRC, 2023). Over time, land-use competence is redefined as regulatory compliance rather than adaptive navigation of complex socio-ecological systems.

The marginalization of Sámi toponymy, as documented by the Truth and Reconciliation Commission (TRC, 2023), weakens place-based knowledge and undermines herders' ability to articulate land-use needs within state regulatory frameworks. Sámi place names function as a mnemonic and ecological knowledge system, encoding detailed understandings of pasture quality, seasonal suitability, snow conditions, animal behavior, and movement routes that are essential for adaptive nomadic pastoralism.

Herders described how fixed dates for pasture transitions and rigid interpretations of maximum reindeer numbers reduced their ability to respond to weather anomalies, ice conditions, and disturbances. (Eira I. M. G. et al., 2025). Over time, these measures narrowed the space for Indigenous decision-making and redefined land-use competence as compliance with administrative rules rather than as skilled navigation of complex socio-ecological systems (Turi, 2016).

Distortions of *duodji*

Duodji represents a central domain where reindeer husbandry, material knowledge, language, and ethics intersect. Traditional

duodji depends on access to reindeer-based materials (hide, sinew, bone, horn), seasonal timing, and fine-grained evaluative skills transmitted through practice. *Duodjediahtu* constitutes a domain-specific expression of Indigenous nomadic pastoral knowledge (Triumpf, 2011). Finnicization in Finland, through schooling, church, and administrative language regimes, has undermined Sámi *duodji* as a knowledge system, practice, and livelihood. Triumpf (2011) shows that *duodji* is not merely a craft, but a Sámi-language-anchored epistemology (*duodjediahtu*), transmitted through resource-based and the household-based, intergenerational collaboration, and participation in everyday practice. Erosion of the Sámi language, learning arenas, and household economies has therefore directly weakened the continuity and quality of *duodji*.

Testimonies to the TRC highlight how institutional schooling and majority-language instruction removed children from household-based work rhythms where *duodji* knowledge is traditionally acquired. At the same time, reduced access to materials due to regulatory changes in slaughtering and land use weakened the material foundations of *duodji* (Triumpf, 2011). The result is not the disappearance of *duodji* as a symbolic practice, but its gradual de-professionalization as a living knowledge system tied to reindeer husbandry.

Institutional schooling has displaced children from the work rhythms in which *duodji* is traditionally learned (Gaup, 2008), while nuclearization and weakened *siida* relations have reduced opportunities for observational learning and guided participation. As a result, fewer young people acquire advanced *duodji* competence, and entrants to *duodji* education increasingly arrive with narrower knowledge bases (Triumpf, 2011).

Triumpf (2011) further demonstrates a fundamental mismatch between *duodji*'s spiral, situational temporality, attuned to season, light, humidity, and material quality, and the linear time regimes of schooling and standardized curricula. Combined with reduced access to raw materials through fragmented landscapes and weakened reindeer-based material cycles, this displacement undermines the fine-grained judgments, terminology, and ethics that make *duodji* a living Indigenous knowledge system rather than a transferable technique.

Across language use, land governance, and *duodji*, a common pattern emerges assimilation operates through governance mechanisms that translate Indigenous nomadic pastoral knowledge into standardized administrative forms. These translations privilege predictability, control, and quantification, while marginalizing relational, adaptive, and language-embedded expertise. The TRC (2023) demonstrates that these cumulative processes undermine trust, flexibility, and knowledge transmission, weakening the foundations for Indigenous self-organization and resilience.

Discussion: household governance, knowledge transmission, and the limits of rationalization

This article has examined how Norwegianization and state-led assimilation and modernization have reshaped Sámi reindeer husbandry by altering the conditions for practicing, transmitting,

and governing Indigenous nomadic pastoral knowledge. Rather than treating assimilation as a closed historical phase, the analysis demonstrates how assimilative effects persist through contemporary governance instruments, administrative routines, and state-dominant knowledge frameworks. From a reindeer herders' systems perspective, these transformations intervene directly in the adaptive dynamics of a non-equilibrium rangeland system. Policies introduced in the name of economic efficiency and sustainability reconfigure the very mechanisms that sustain resilience, marginalizing Indigenous institutions such as the *siida*, Sámi language domains, and pastoral epistemologies upon which adaptive capacity depends.

Sámi reindeer husbandry operates within highly variable Arctic environments characterized by stochastic snow conditions, rain-on-snow events, icing, insect harassment, and fluctuating forage accessibility. Under such non-equilibrium conditions, resilience depends on mobility, flexible herd composition, timely slaughter strategies, and *siida*-based collective judgment. Adaptive capacity is generated through the relational coherence between *birgenvuoddu* (resource base), *báikevuoddu* (household), and *máhtovuoddu* (knowledge base). The household functions not only as an economic unit but as the primary arena in which situational assessment, risk buffering, and intergenerational learning are enacted within the *siida* system.

Seen considering the *dáruiduhttin* (Norwegianization governance) reforms, these governance reforms represent a gradual displacement of these relational foundations of Sámi reindeer husbandry. When state policies intervene in e in herd composition, slaughter strategies, licensing systems, and internal rights allocation, they constrain the flexibility required to respond to environmental variability. Testimonies to the TRC illustrate how governance reforms are experienced as direct interventions in this system. As one herder expressed, "The authorities began to control reindeer husbandry so strictly. We are no longer allowed to decide which animals to slaughter or how large the herd should be . . . Before, we knew ourselves what to do; today we no longer know." This statement captures more than regulatory burden; it reflects a shift in epistemic authority from *siida*-based adaptive judgement to externally defined indicators. Similarly, the description of governance as "Norwegianization through power" signals how rationalization is experienced as dispossession of decision-making over one's own herd and livelihood. When slaughter decisions, herd size, and migration timing are governed through fixed ceilings and standardized metrics, pastoral competence is redefined as compliance rather than adaptive navigation of variable socio-ecological systems.

The fact that most testimonies were delivered in Norwegian, despite a predominance of Sámi participants, reflects the long-term linguistic effects of assimilation (Rasmussen, 2025). Language loss is therefore not only a historical issue but shapes contemporary documentation, governance interaction, and epistemic authority. By weakening these relational structures, Norwegianization has affected not only language and identity but the very governance mechanisms that enable resilience in variable Arctic rangelands. These structural transformations must be understood considering accelerating climate variability in the Arctic. Increasing frequency of rain-on-snow events, ground icing, and unstable snow conditions disrupt forage accessibility and intensify the need for flexible herd

composition, timely migration, and locally grounded judgement. Under such non-equilibrium conditions, adaptive capacity depends on the integrity of *siida*-based decision-making, mobility, and household knowledge transmission. When governance systems constrain these relational foundations through fixed herd ceilings, rigid administrative categories, and spatial fragmentation, they reduce the very flexibility required to respond to climatic stress.

The absence of practical pastoral competence fundamentally alters what can be perceived and acted upon in Arctic rangelands. Without the "knowledgeable gaze" developed through herding practice, key landscape features remain invisible to outsiders such as *jassa*, summer snow patches that reindeer use to escape insect harassment (Meløe, 1988). When such features are not recognized, they are also not accounted for in management decisions. This perceptual gap has concrete consequences: it shapes how pastures are evaluated, how herd movements are regulated, and how sustainability is defined. Historical reindeer meat inspection practices further illustrate how Sámi knowledge was misrecognized or dismissed in institutional contexts, contributing not only to everyday discrimination but to the systematic marginalization of Indigenous pastoral competence in governance processes (Sara and Mathiesen, 2020). Such misrecognition is not merely symbolic; it reshapes whose knowledge counts in decisions affecting herd survival under non-equilibrium conditions, including icing events and climatic variability.

This article further shows that tensions in reindeer husbandry governance arise less from regulation *per se* than from misalignment between management rationalities. State systems emphasize predictability, equilibrium, and standardized indicators such as fixed reindeer numbers and carcass weights. Sámi nomadic pastoralism prioritizes flexibility, herd diversity, and adaptive responses to environmental variability. When governance operates primarily in majority languages and relies on categories that lack correspondence with Sámi professional terminology, Indigenous assessments of pasture conditions, proportionality, and collective responsibility are translated into administrative forms that distort their meaning. As the Commission documents, correspondence and subsidy criteria written in Norwegian or Finnish often fail to align with Sámi understandings, producing everyday misunderstandings and constraining adaptive decision-making. As shown in participatory research from West Finnmark, state management continues to rely on carcass weights, reindeer numbers, and density indicators as measures of sustainability, reflecting a positivist-reductionist paradigm that contrasts sharply with Sámi pastoral emphasis on balance, flexibility, and adaptation to climatic variability. (Eira I. M. G. et al., 2025). Historical documentation from the eighteenth century demonstrates that Sámi reindeer husbandry already constituted a highly differentiated nomadic pastoral knowledge system. Detailed terminology for herd structure, age and sex categories, castration practices, migration, and ecological conditions indicates that herd management was organized through *siida*-based cooperation and adaptive, mobility-centred logics. This historical continuity challenges narratives that frame post-1970s reforms as introducing rationality or sustainability into reindeer husbandry. Rather, state-led modernization intervened in an already coherent non-equilibrium pastoral system grounded in relational ecological knowledge and practice-based governance (Eira I. M. G. et al., 2025).

Impacts on knowledge transmission are particularly visible in the reconfiguration of learning arenas. Although formal education and training have expanded, they have rarely assumed responsibility for sustaining Indigenous knowledge on its own epistemic terms. When learning is detached from seasonal migration, slaughter practices, duodji production, and intergenerational cooperation within households, knowledge becomes fragmented and less applicable to pastoral realities. As one testimony notes, “They did not only destroy reindeer husbandry. They also destroyed the reindeer herding families.” This statement underscores that assimilation operates through restructuring the household as a site of authority and transmission, thereby weakening the socio-ecological infrastructure that sustains resilience.

These assimilation-driven transformations have unfolded alongside globalization, infrastructural expansion, and land-use encroachment, contributing to cumulative fragmentation of grazing areas. Spatial constraints interact with climatic variability, further limiting mobility options that are central to buffering stochastic events. In such contexts, reducing herd flexibility or restricting movement through administrative boundaries compounds ecological risk.

When Indigenous nomadic pastoral knowledge is translated into administrative categories misaligned with Sámi pastoral logics, the consequences extend beyond semantic distortion. This misalignment generates recurring misunderstandings between herders and authorities, increases bureaucratic conflict, and narrows the scope for locally grounded judgement. Over time, it shifts decision-making authority away from siida-based evaluation of pasture conditions and herd dynamics toward externally defined metrics, thereby weakening adaptive capacity in a highly variable socio-ecological system. Reindeer husbandry features prominently in the Commission’s material, with over 300 testimonies addressing governance conflicts, land-use pressures, and administrative intervention (Rasmussen, 2025). This underscores that pastoral governance remains a central site where assimilation is experienced in practice.

From a *seanadit* (reconciliation) perspective, restoring robustness in Sámi reindeer husbandry requires more than symbolic recognition. It requires epistemic realignment: re-establishing conditions under which Indigenous nomadic pastoral knowledge functions as a legitimate governance system in its own right. In non-equilibrium rangelands, as another testimony emphasized, “The first step must be to take our knowledge and customs seriously ... and to gain acceptance in all institutions and arenas where decisions are made.” If contemporary policies continue to privilege standardized, equilibrium-based management while marginalizing household-based and siida-based knowledge systems, they risk reproducing structural barriers to Indigenous resilience under accelerating climate and land-use pressures.

Reconciliation in pastoral contexts therefore hinges on epistemic realignment: recognizing Indigenous knowledge not as supplementary cultural heritage, but as a living governance system capable of sustaining adaptive capacity in highly variable Arctic rangelands. Whether current reforms enable *seanadit*, the capacity to adapt, recover, and thrive, depends on whether policy frameworks can accommodate the relational, language-embedded, and mobility-centered foundations of Sámi nomadic pastoralism.

Conclusion: *seanadit* as a condition for robustness and reconciliation

This article has examined how Norwegianization and subsequent governance reforms have reshaped Sámi reindeer herders’ conceptualizations of sustainable reindeer husbandry and altered the production, transmission, and legitimacy of Indigenous nomadic pastoral knowledge across institutional and practice-based learning systems. The findings demonstrate that assimilation continues to operate through governance mechanisms that constrain language domains, restructure household authority, narrow learning arenas, and redefine pastoral competence as administrative compliance.

State-led rationalization and modernization policies, introduced under the banners of efficiency and sustainability, have progressively narrowed the epistemic space within which Sámi nomadic pastoralism operates. Governance frameworks have privileged standardized indicators, majority-language administration, and equilibrium-oriented management models, while marginalizing knowledge embedded in Sámi professional terminology, toponymy, siida organization, duodji, and mobility-based land use. When Indigenous knowledge is translated into administrative categories lacking conceptual equivalence, its relational and adaptive dimensions are weakened across multiple domains simultaneously.

These transformations must be understood in context of accelerating climate change, land-use fragmentation, infrastructural expansion, and global economic pressures. Increasing climatic variability, including icing events and unstable snow conditions, intensifies the need for flexibility, herd diversity, and mobility within a non-equilibrium rangeland system. Climate change does not operate in isolation; it amplifies vulnerabilities produced through epistemic and institutional misalignment.

Under such conditions, robustness cannot be achieved through further standardization or tighter administrative control. What is required is *Seanadit*, understood here as reconciliation grounded in institutional and epistemic realignment. *Seanadit* entails restoring coherence between knowledge, practice, language, household–siida organization, and governance. It is not a return to the past, but a forward-looking condition for sustaining adaptive capacity in Arctic pastoral systems.

Meaningful reconciliation therefore depends on whether governance, education, and land-use policies enable Indigenous nomadic pastoral knowledge to function as a legitimate basis for decision-making. This includes strengthening intergenerational transmission, supporting Sámi language domains, and ensuring that women, youth, and smaller herd holders are not structurally marginalized. Without *Seanadit* as a guiding principle, neither reconciliation nor long-term sustainability of Sámi reindeer husbandry under climate and land-use change can be realized.

This article advances the assessment of how assimilation through governance and education has reshaped Sámi nomadic reindeer herding by systematically excluding Sámi knowledge from

educational and governance structures, with significant consequences for intergenerational knowledge transmission, learning arenas, and pastoral resilience.

Ethics statement

Written informed consent was obtained from Margit Hansen-Krone and Karen Anna Logje Gaup for the publication of potentially identifiable images included in this article.

Author contributions

AO and MT Reindeer Husbandry and Resilience. IME Herders' Professional language and traditional knowledge. IME and SM Gender sensitive knowledge in reindeer husbandry RES Reindeer Herders Food System AMM-E. The Impact of the Finnish Language on Sámi Reindeer Herders' Place-Name Competence. A case report RT Finnization in Finland and Traditional Sámi Duodji: A Case Report. MB, MEJ, IEG Passing on Sámi traditional knowledge to future generations in educational systems. All authors contributed to the article and approved the submitted version.

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Conflict of interest

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