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Hear the herd: the power of Sámi perspectives for achieving just transitions in Norway

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Introduction: For achieving just transitions, it is crucial to address Indigenous perspectives and knowledge systems. In the North of Europe, the fast pace of transformational actions toward the decarbonisation of society has caused much controversy associated with the (further) endangerment of the traditional modes of life. Reindeer herding is a traditional activity of the Sámi, the Indigenous Peoples of Norway, Sweden, Finland, and North-Western Russia. For many Sámi, reindeer herding is of economic, social, and cultural importance. However, increasingly, pressures are being put on reindeer, as human activities, such as the building of roads or wind turbines, further encroaches on grazing lands.

Methods and objective: Using semi-structured group and individual interviews, this article investigates Sámi perspectives on drivers and stressors impacting reindeer in Norway and its connections to sustainable development activities, in the context of the energy transition. It also focuses on the communication of Traditional Ecological Knowledge to better address inclusive decision-making processes.

Results: The results highlight the divide between Western and Indigenous ways of thinking about land management and use. They provide reflections on why Traditional Ecological Knowledge, including from the Sámi is still far from being actively integrated in the processes toward Just Transitions. This work also brings to light some of the reasons behind the hesitance of many Indigenous Peoples to integrate mainstream transition processes as well as make available their Ancestral Knowledge for the benefit of nature conservation and sustainable management of the areas they inhabit. Lastly, the article offers some insight into how to facilitate communication of Traditional Ecological Knowledge and its potential impact on the current Norwegian strategy toward nature conservation and societal decarbonization.

KEYWORDS

energy justice, recognition justice, just energy transitions, Sámi People, Indigenous Peoples, traditional ecological knowledge, Indigenous rights, wind energy

1 Introduction

The Sámi are the Indigenous Peoples of Norway, Sweden, Finland, and North-Western Russia, and their homeland reaches across Northern Fenno-Scandinavia eastwards to the Kola Peninsula, an area known as the Arctic-Alpine zone (Kent, 2018). Despite changes in the socio-economic landscape of Sámi, reindeer herding still holds high cultural and economic importance for many. In Norway, Sámi People have the exclusive right to herd reindeer in six regions: East-Finmark, West-Finmark, Troms, Nordland, North-Trøndelag and South-Trøndelag/Hedmark (Landbrusksdirektoratet, 2024). While

reindeer herding is by law a right of the Sámi People in Norway (Landbruks- og Matdepartementet, 2021), it is currently under intense pressure. In Norway, Sámi grazing areas account for around 40% of Norway's land area (Landbruks- og matdepartementet, 2017; Landbruksdirektoratet, 2024). However, today, not all of these areas are suitable or available for grazing because of cities and towns, agricultural areas, as well as industrial and tourist facilities (Norwegian Ministry of Agriculture and Food, 2023). Other human activities, such as building roads or other infrastructures are further encroaching on traditional grazing lands. At the same time, there are additional challenges to herding rooted in climate change, pasture degradation, and predation (Pape and Löffler, 2012; Landbruksdirektoratet, 2024). Reindeer husbandry depends on the diversity of accessible natural pastures (Pape and Löffler, 2012; Landbruksdirektoratet, 2024). Given these circumstances, as of 2021, wild reindeer are classified as (nearly) threatened animals on the Norwegian red list (Artsdatabanken, 2021; Miljødirektoratet, 2023; Forollhogna National Park, 2024).

Another factor for the present and future loss of areas for grazing is the competition for land use by renewable energies mostly for the placement of wind farms and dams. Scandinavia's decarbonization plans for the energy sector are some of the most ambitious in Europe and the world (Sovacool, 2017; EU2020, 2020). The strategy of these countries includes strong investments in wind energy (Kofoed-Wiuff et al., 2020), which translates into "competition" for available areas to set up, usually onshore farms of considerable size. This situation is particularly acute in traditional Sámi People areas dedicated to reindeer husbandry, as confirmed by several studies conducted in Norway, Finland and Sweden about the processes and impacts related to the tendering, construction and operations phases of wind farms (Kaapke, 2018; Ahlness, 2020; Luundberg and Richardson, 2021). Despite the regional differences, research conclusions are quite similar and point out many cases of alienation, contestation and disregard of Sámi (and other Indigenous Peoples') culture and wellbeing (Normann, 2021; Fjellheim, 2023b; Karam and Shokrgozar, 2023).

The present situation of the Norwegian Sámi herders is particularly tense, given that despite reindeer herding being protected by law, there are actions and plans that can further jeopardize this activity (Ravna, 2020; Kimura, 2024; Linnainmaa, 2024). The right to reindeer herding is deeply connected with Sámi traditions and modes of knowledge which are fundamental to the continuity of the practices and carry political weight (Johnsen et al., 2017). Despite the richness and relevance of these traditions and knowledge (Eythorsson and Thuestad, 2015), they have not been easily recognized by scholars and society as being valuable and relevant (Helander-Renvall and Markkula, 2017). Research shows that the Sámi People's Traditional Ecological Knowledge (TEK), in the sense of knowledge and practices passed from generation to generation, should be foundational when researching conservation and sustainable management of resources, like reindeer (Axelsson-Linkowski et al., 2020) or plants (Rautio et al., 2016), but also about climate change (Riseth et al., 2011).

Despite the growing acknowledgment of the benefits of including this knowledge in policies and decision-making (Sun, 2024), this has not been always the case (Hansson, 2018), especially in connection to wind development (Fjellheim, 2023a; Heikka-Huber, 2023).

All the issues above described can be analyzed under the scope of Justice as they integrate an inherent dimension of "rightness", here considered in the sense of being (negatively) affected and/or involved in societal processes in a (non-)correct way. There is a troubled relationship between the Norwegian Sámi People (incl. herders) and the overall rest of the Norwegian society that deserves to be considered. In this context, the relation will be considered within the landscape of energy transitions, as some of the ongoing tensions occur or became acuter due to strategies and activities toward greener energy production. This is surely in contrast with what is largely understood as a just energy transition: "a fair and equitable process of moving toward a post-carbon society (...) striving for a more equitable distribution of benefits and burdens and ensuring that vulnerable groups are not disproportionately harmed" (Gładkykh et al., 2023, p. 7).

Given the current landscape, the goals of this article are to contribute to a better understanding and improve practices for the systematic inclusion of Sámi People in sustainability transitions. We argue that TEK has the potential to advance energy shift more fairly, especially in countries like Norway, where Indigenous Peoples have had conflicts with authorities, in the last years, over several green energy projects (onshore wind). By analyzing the views of some Sámi from the region of Trøndelag (Norway) on the current and foreseeable barriers impacting reindeer movement, as well as how can Sámi knowledge of drivers and stressors be communicated to society and policymakers, we aim at helping to bridge between Western and Indigenous ways of thinking about land management and use and ultimately, build modes of energy generation that respects both environment and people.

The article is organized in the following way: first, there is an overview of sustainable energy transition implications and connections to Sámi People, under the framework of the 3-tenets of justice. After that, there is a short outline of the current and potential role of TEK in shaping energy transitions, mostly associated with land use and herding. This section is followed by a description of the theory and methods employed for the empirical study. The last sections are dedicated to the results and discussion, focusing on the justice implications of energy infrastructure on herding and the challenges of communicating Indigenous Knowledge, vis the example of map building. In the last part of the article, conclusions are drawn about facilitating communication of TEK and its potential impact on the current Norwegian strategy toward nature conservation and societal decarbonization.

2 The price of energy: justice implications of green energy for Sámi People

To understand the effects of the transformation of the energy system toward decarbonization on Indigenous Peoples such as the Sámi People, it is relevant to apply a conceptual framework that allows the identification and problematization of the issue. Literature on the topic of Indigenous People (incl. Norway) distinctively shows justice as being one of the most relevant key aspects to consider (Tsuji, 2021; Ibrahim, 2024; Segovia-Tzompa et al., 2024).

There are several energy justice frameworks available to benchmark this analysis, which can focus, for example, on the complex political and economic forces that routinely produce energy injustice (Lee and Byrne, 2019), the remediation processes in response to a perceived energy injustice or within the large framework of environmental justice (Lacey-Barnacle et al., 2020). There is also the possibility of using philosophical lenses (Jones et al., 2015; Pellegrini-Masini et al., 2020) and transition studies (Carley and Konisky, 2020; Sovacool et al., 2021; Romero-Lankao et al., 2023) to analyze the (moral and societal) effects of the transition of the energy systems. In the case of Indigenous People being the main actors of the energy transition, as well in other cases, a considerable number of publications utilize what is called “3-tenets of energy” (Jenkins et al., 2016; Otte et al., 2018; Ramasar et al., 2022; Leandri and Gumustekin, 2024). This approach categorizes according to the relations established among agents that involve the material treatment that people receive, involvement in processes and failures in awareness. Independently of the merits of each of the mentioned theories or approaches, they have limitations such as the lack of systematic inclusion of spatial analyses of neglected regions (Alegre-Bravo et al., 2025), non-western philosophical traditions or of a systemic approach to developed & developing country relations (Lacey-Barnacle et al., 2020) and gender dimension (Feenstra and Özerol, 2021).

As explained before, we adopt the approach of Jenkins et al. (2016) to energy justice due mostly to its well-accepted application in the context of the Sámi People (Cambou, 2020; Ramasar et al., 2022; Edwards, 2023; Mósesdóttir, 2024). In this framework, it is possible to distinguish 3-tenets of justice: distributive (or distributional), procedural, and recognition. Usually, distributive justice is discussed in connection to the allocation of goods and burdens in a particular setting, society or group. It relates to a set of principles for the sharing of resources that rational individuals see as legitimate or fair (Jasso et al., 2016). The currencies of distributive justice can be quite diverse, from economic and financial benefits to common goods such as water and land (Timmer, 2021). In general, within the distributive justice debate, it is also relevant to pay attention to the type of allocation criteria that preside over the distribution of goods, as well as to the types of justice currencies (i.e., goods) and agents involved. Allocation principles are mostly based on merit/desert, equality and need for the goods and the agents involved can range from individuals to communities and even, nations. An allocation based on merit would be based on persons' abilities and talents, whereas a system based on desert would focus on persons' efforts and performances for which they are responsible (Lamont, 1994; Wilson, 2003).

For the most part, procedural justice is tied to several limitations of current decision-making processes in guaranteeing adequate representation and autonomy of individuals (and certain communities) in socio-political procedures, which include technological developments and deployment (Pellegrini-Masini et al., 2020). The last justice dimension of energy justice is recognition justice, which connects to the (systematic and proper) acknowledgment of vulnerable groups and how they are waged by distributional and procedural injustices so that it is possible to correct them. To accomplish recognition justice requires the perception of vulnerability and disadvantage that characterize the

lives of individuals and groups, being mostly related to gender, low-income, migrants, and ethnic or religious minorities (van Uffelen, 2022).

In the connection to Indigenous communities, more concretely with Sámi People, the energy justice debate is frequently associated with intersectional aspects of distributive, procedural and recognition shortcomings mostly associated with onshore wind energy projects. This state is also recognized by the communities themselves. Many Sámi People have been looking at sustainability transformations, and in particular wind energy developed as the “renewal of historical processes of dispossession through accumulation and colonialism, enabled by harmful knowledge gaps in (Norwegian) society and institutions” (Normann, 2021, p. 77). This approach stands in sharp contrast to long-standing Sámi values of responsibility and ecological practices (Jääskeläinen, 2020).

Another relevant aspect in this context is the constant tension between (Scandinavian) governments, who are and want to continue being forefront of efforts to promote sustainable energy production, and their (sometimes questionable) efforts toward the realization of the rights of the Sámi Indigenous Peoples, mostly to ensure (social) justice which has been escaping many local communities. Over the last decade, several UN international reports and national lawsuits have provided evidence that the legal and policy system still fails to accommodate the rights of the Sámi People under international legal standards concerning the rights of Indigenous Peoples (Loukacheva et al., 2015; Carstens, 2016). As a result, the question of the misrecognition of the unique status and rights of Sámi reindeer herders as an Indigenous Peoples and their right to participate as a group in the decision-making process affecting them looms large in the debate concerning the governance of their land and natural resources (Cambou, 2020). This situation is abundantly clear in the events leading to stopping of the Fosen wind farms in Norway (Otte et al., 2018). In a nutshell, the case of the Fosen wind farms relates to the development project in Sámi traditional grazing areas. The 2021 court judgement concerned the validity of the Norwegian Ministry of Petroleum and Energy's previous decision on expropriation and granting a license to wind power plants on the Fosen Peninsula. The herders claimed that the construction interfered with their right to enjoy their own culture according to Article 27 of the UN International Covenant on Civil and Political Rights (ICCPR). In the end, the Norwegian grand chamber of the Supreme Court unanimously found a violation of Article 27 and stated that the license and expropriation decisions were invalid (NIM, 2023). This example equally shows the lack of clear and consistent procedural justice which alienated the views of Sámi herders who participated in the decision-making process when wind energy exploration licenses were granted. In the view of Mósesdóttir (2024, p. 10), the economic interests of the majority state-owned company (Fosen Vind DA) were given more weight than the potential risk of human rights violations, most likely because, the Norwegian state has the resources to compensate the Sámi community (if required) in the case of the human right to a healthy environment not being balanced with their Indigenous rights, recognized by law.

Sámi communities are particularly exposed to distributional injustice via the burden of placement of onshore wind on their

mode of life, as well as the lack of benefits in the form of retributions and/or compensations, that the energy companies and municipalities have failed to provide. When it comes to Sámi livelihoods, “wind power development portends the issue of landscape fragmentation that is used for reindeer husbandry, due to the expansion of new roads and power lines. Such alterations of the land yield a high risk of endangering the traditional practice of reindeer herding in the long-term, possibly to a complete destruction” (Ramasar et al., 2022, p. 4).

What is particularly interesting in the case of the Sámi People in Norway (and in other Scandinavian countries) and wind energy development is the interconnectedness of energy and land justice. The distributional, procedural and recognition injustices of the Norwegian energy transition processes, concerning wind energy, build up to the (past and present) dispossession of traditional territories and the inequitable access to land required for economic, food and cultural autonomy and identity (Williams and Holt-Giménez, 2017). This results in a transition that neither meets the justice requirements of “leaving- no- behind” (UNSDG, 2024), nor integrates values and practices key to social and environmental sustainability, in Scandinavia, as we will discuss more in the next section.

3 Traditional Ecological Knowledge: a missing piece of the energy transition?

The understanding of the Indigenous Peoples’ conceptions of ecological relationships held by their people or culture is not yet widely disseminated in Western societies as much of that knowledge tends to stay close to the initial communities (Lertzman, 2010; McCarter and Gavin, 2011). TEK (also known as Indigenous Knowledge) is then a designation that tries to capture these conceptions and the ongoing accumulation of knowledge, practices and beliefs about relationships among the ecosystemic elements (human, non-human and abiotic) acquired by Indigenous Peoples over thousands of years through direct contact with the environment and passed on from generation to generation. We define TEK after Berkes et al. (2000, p. 1252), who states that TEK is “... a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment”.

In the last years, there has been an effort to incorporate and make use of TEK, in general, in sustainability (Blaser et al., 2008; Nelson and Shilling, 2018), in particular, in thematic areas like ecosystem-based management of resources (Lertzman, 2010; Brattland and Mustonen, 2018), conservation (Ens et al., 2021) or environmental assessment (Usher, 2000). Another area where TEK related to the Sámi People is being slowly but surely recognized as being of high value for sustainable transitions in land management connected to their vast knowledge of reindeer husbandry (Markkula et al., 2019). However, what seems to be the missing link is the recognition and application of such knowledge to the energy context itself.

It seems clear that there is still a disconnect between what could be adequate areas for wind development given the Scandinavian Sámi People’s knowledge (and wishes) and the (sustainability)

reasoning for wind farm placement. This situation is also present in overall built infrastructure [incl. powerlines (Vågenes, 2023)], affecting other sectors like buildings and roads (Bickford et al., 2016). In any case, there is already research responding to the challenges and incorporating Sámi People’s knowledge into, for example, models for setting potential wind power plants (Grimsrud et al., 2024).

What is less apparent but equally relevant is how TEK could be an instrument shaping the overall understanding and path of a just energy shift. A few authors have already pointed out and reflected upon the benefits of including and articulating TEK with environmental interests in general (based mainly on Western science and methods) (Buell et al., 2020; Peacock et al., 2020), and also in achieving solutions that are socially acceptable and ultimately, fair(er) means of green energy production (Nilsson Dahlström et al., 2021; Pimentel da Silva et al., 2021; Engen et al., 2023). This has been the case, for example in Norway and Sweden, with the development of less invasive hydropower projects (Össbo, 2018; Engen et al., 2023) and also, in connection to the placement of onshore wind farms (Nilsson Dahlström et al., 2021). Nevertheless, research also makes clear that the potential for TEK and the Sámi community to shape projects and strategies faces serious barriers, which span from political “colonialism” (Normann, 2021) and energy production maximization (Grimsrud et al., 2024) to misunderstanding the Indigenous People’s positions toward the energy shift (Fjellheim, 2023a). As we continue exploring in the next sections, we support the understanding that TEK can indeed have a positive concrete effect toward the accomplishment of more environmentally friendly and also fairer energy transitions.

4 Theory and methods

In this study, we implement a Grounded Theory Approach. The purpose of the Grounded Theory Approach is to generate theory from data (Corbin and Strauss, 1990, p. 12). Thus, Grounded Theory employs an inductive approach rather than a deductive one (Glaser, 1992). We start from a point of general inquiry into the topic of barriers impacting reindeer in Norway and how to communicate this knowledge, and we develop a theory based on data collected through qualitative, semi-structured interviews. We worked to create trust between the Sámi community and ourselves as researchers. Thus, we conducted group and walking interviews (see Table 1). Group interviews encourage multiple participants to share their knowledge about a given topic (DiCicco-Bloom and Crabtree, 2006). Our decision to conduct group interviews was validated by the participants in the first interview, who noted that, culturally, it is much easier for Sámi to speak in groups. Following the group interviews, one interviewee wanted to show us his experience and knowledge by taking us on a walk in nature. Walking interviews or “go-along” interviews are an innovative, qualitative research method in which researchers and interviewees talk while walking together (King and Woodroffe, 2017). This type of interview is valuable for gaining a deep understanding of lived experience as well as reducing power imbalances between the researcher and interviewees (Bilsland and Siebert, 2023). This interview was especially valuable as it created a collaborative atmosphere for talking about the value of nature, the Sámi People’s

TABLE 1 Type of interview, participants, form of interview.

Type of interview	Participants present	Form of interview
Group interview 1	Participant 1	Digital
	Participant 2	
Group interview 2	Participant 1	In-person
	Participant 3	In-person
	Participant 4	In-person
Walking interview	Participant 1	In-person

connection and appreciation for nature, as well as Sámi spirituality. Walking interviews allowed us to learn more about the interviewee's relationship with nature, as well as show us Sámi cultural heritage sites. Conducting semi-structured interviews allowed us to ask follow-up questions, thus helping us to understand the different perspectives on the multifaceted, complex topic at hand. This method also is compatible with the Sámi culture of storytelling.

We used the snowballing technique to acquire interviews. Initially, we were contacted by two Sámi who saw information about the project through which this research is funded. They agreed to be interviewed and provided us with other contacts within their community. A danger of the snowballing technique is that researchers use the same network of respondents, who could see the world through the same lens (Bleich and Pekkanen, 2013). However, due to our position as non-Sámi “outsiders”, the snowballing method seemed the best approach as we did not have easy access to the community.

These interviews were part of a wider Norwegian-funded research project on cumulative impact studies and applications to aid conservation and sustainable management of reindeer in Scandinavia (ONEIMPACT). To accomplish the project's objective of developing a conceptual and methodological framework for the quantification of the total effects of the different stressors, most notably renewable energy, on the reindeer ranges, it was deemed necessary to involve stakeholders, in particular the Sámi herders, to develop concrete strategies integrating Traditional Ecological Knowledge in the sustainable management of Reindeer husbandry (Forskningsrådet, 2024). The purpose required the capturing the “voice” of the Sámi herders. Some of these contacts happened, via interviews used in this research. It is important to note that some the Sámi People involved in the project were skeptical about it, which they expressed during the interviews held for this specific work. Still, the discontent did not involve this particular research and its activities, which allowed the investigation to move forward.

While the first interview was held digitally, the following ones were held in person in a Norwegian town with a rich Sámi culture. The interviews were held in Norwegian. During the interviews, the researchers took field notes, which were thoroughly discussed to ensure they were comprehensive and accurate. Afterwards, the data was analyzed by grouping and coding these notes by theme and content. The decision to take written notes after the first interview (instead of audio recording) was due to ethical concerns about the potential inadequacy of the method to the real-life conditions of in-person interviews.

As non-Sámi individuals, the researchers acknowledged their lack of familiarity with Sámi culture and reindeer husbandry. When approaching the research and interviewees, the researchers attempted to be “students” of the participants, allowing them to guide and teach during the process. To address ethical questions that arise when non-Indigenous Peoples research Indigenous Peoples, the researchers worked to be transparent about the aims and means of the investigation.

We by no means see this as a comprehensive, generalisable study; it does not consider Sámi perspectives across all regions of Norway. Nonetheless, the study provides insight into how (some) Sámi in Norway view the ongoing transformation of their lands and how to communicate their ancestral knowledge as a means of shaping that transformation. While the study only included four interviewees, interviews spanned several hours. Thus, despite the low number of interviewees, we still collected rich data that helped frame the discussion and conclusions of this work. The interviewees were either reindeer herders themselves or from reindeer herding families.

5 Results

The latest social events happening in Norway concerning (wind) energy attest to what was discussed in the previous sections. Sámi people's recent battle against the wind park at Fosen in Trøndelag, in which they won against the wind company in the Norwegian Supreme Court has perhaps opened the public's eyes to the large issue of humans' interference with nature in the context of sustainable energy transitions (Supreme Court of Norway, 2021). Interviewees stated that they, as Sámi People, had a different understanding of the non-Sámi People regarding what constitutes human interference with nature. While wholeheartedly agreeing that large wind parks, such as the one in Fosen, they still believe such projects constitute interferences with the environment as they hold broader understanding of the natural world. Similarly, interviewees emphasized that Sámi People had a different understanding of barriers than non-Sámi people. Sámi perspectives on human interference with nature are rooted in the Sámi mantra of “leaving no trace”. Historically, the Sámi People followed their reindeer, living (in) Gamme which is a hut or tent covered with fabric, peat moss or timber (Søbstad, 1981). This nomadic lifestyle left little to no trace behind. Today, you can walk straight through old Sámi settlements without realizing it, a stark contrast to walking through a Norwegian settlement from the same time. During the walking interview for this study, despite being open-minded and focused on learning about the Sámi culture, we, the researchers, unknowingly walked through a Sámi settlement from the 1800s, only realizing where we were when the interviewee pointed it out. This episode attests to how “easy” it is for non-Indigenous peoples to fail to recognize the relevance of TEK just due to the lack of evident physical testimonies of good sustainable practices. Such a situation amounts to the recognition bias that sustainable (energy) transitions frequently suffer and that has been mentioned, in the previous section.

5.1 Energy infrastructure as barriers to reindeer movement

Interviewees highlighted industry-associated infrastructure, such as wind parks or dams, as a barrier to reindeer movement. According to interviewees, the sound of wind turbines stresses the reindeer, and, therefore, reindeer generally avoid walking close to the turbines. However, occasionally, young reindeer wander into the wind park. Additionally, wind park construction and maintenance work require roads and bring an influx of vehicles, which was also seen by the interviewees as a barrier to free reindeer movement. Dams, according to interviewees, also can have negative effects as they divide, encroach upon, and eliminate pastureland.

Another issue pointed out by the interviewees was the effect of the presence of people on the overall behavior of reindeer. This exact situation is well-exemplified by an article in a Norwegian newspaper, which describes reindeer avoiding an important mating area due to a man camping in the area. The Norwegian man was unknowing of the fact that his sole presence disturbed the reindeer (Larsen, 2022). Even though one person can already disturb reindeer, interviewees highlight that what is most problematic is large groups of people frequenting an area. This situation highlights how construction workers and other company staff presence, even if on adjacent lands, could interfere negatively with the health of herds. People, especially a constant flow of people, can push the reindeer to walk in another direction. Moreover, even trails established by people walking the same route can almost, at times, be comparable to country roads. The reindeer are drawn to where it is easiest to walk and can, therefore, use these trails and end up walking in the “wrong” direction.

5.2 Shaping sustainable transitions via TEK

The Sámi possess extensive Traditional Ecological Knowledge on reindeer and reindeer herding, knowledge that has the great potential to shape sustainable (energy) transitions (Lam et al., 2020; Ludwig and Macnaghten, 2020). In the interviews, we asked how this knowledge could be shared with Non-Sámi People. We have coded Sámi perspectives on this topic into three themes: power, trust, and respect, although the interviewees did not use these words explicitly.

Interviewees often referred to themselves as the minority culture operating in the world of the majority culture. In saying this, they highlight that the point of departure is one of a power imbalance; they are a minority. According to one interviewee, while they, the Sámi, “see” the majority culture, the majority culture does not “see” them. Interviewees highlighted that they want to be involved in projects about reindeer and activities that impact reindeer and reindeer herding, echoing the call of Indigenous Peoples across the globe of “nothing about us without us” (Narr, 2020). At the same time, they are hesitant to join projects in the end stages, as is frequently requested, when they do not have power over the outcome. Even in research projects, the interviewees stated that they should be

involved in the proposal stage, where they have control over the research design. This is particularly relevant to sustainable energy research projects as many (national and European) research agencies have requirements on stakeholder engagement and ethical guidelines for this type of relations and contributions (UK Department for Business, Energy and Industrial Strategy, 2021). The interviewees (in working to educate us as researchers about the Sámi culture), called attention to the Sámi People’s long history of oppression. According to the interviewees, there is a fear that Sámi contributions to projects will be misrepresented and used to, for example, justify and legitimize further encroachments on reindeer grazing land. Therefore, trust is an (ethical) value that needs to be built if fair energy decarbonization is to be achieved.

According to Arnstein (1969), communities should be engaged through a redistribution of power, especially when those communities have previously been marginalized. Arnstein (1969) goes on to emphasize that participating in activities will only feel meaningful to communities when they feel like their voices are heard and that they are true collaborators with decision-making power. Thus, future (industrial and research) projects should, rather than engaging in tokenism—merely ticking the “engage Indigenous Peoples’ box”, work to shift the innate power imbalance by providing Sámi with decision-making power, and thus build the trust necessary for the sharing of TEK.

Finally, interviewees mentioned the importance of respect. First, according to interviewees, while Sámi possess immense knowledge, this knowledge is not always taken into consideration or even gathered at all. There is a persistent feeling of “no one wants to hear” unless it is to their immediate benefit. Second, interviewees highlighted that TEK is often passed down from generation to generation, gained by doing, and often lacks the certifications and diplomas common in Western societies. According to one interviewee, projects engaging Sámi People must respect these Indigenous Knowledge traditions. Literature shows that two main knowledge systems can often collide, as Chilisa (2020, p. 3) points out: “One is Euro-Western and Indigenous to the Western academy and its institutions; the other knowledge is non-Western and peripheral, and it operates with the values and belief systems of the historically colonized. This peripheral knowledge system values relationships and is suspicious of Western academic discourse and its colonizing tendencies”. This disconnection and distrust have been since a long time acknowledged by scholars of colonialism (Thrupp, 1989; Dei, 2000; Allen and Amadi, 2022), influencing this debate also in Europe (Lehtola, 2015).

According to interviewees, those seeking TEK should understand that the Indigenous and Western ways of knowing are not always compatible and instead of working to fit Indigenous knowledge into Western modes of knowledge production, they should learn of and respect these differences.

5.2.1 The challenges of communication: maps as means of sharing Traditional Ecological Knowledge?

Communication of knowledge can be achieved in many forms. One in particular- maps and other geographic visualizations-

has a long tradition of affecting (negatively) Indigenous Peoples (Ojala and Nordin, 2019). It is crucial to remember that maps are never value-free objects, both in the selectivity of their content and in their signs and styles of representation. Maps are a way of conceiving, articulating, and structuring the human world which is biased toward, promoted by, and exerts influence upon particular sets of social relations (Harley, 1988, p. 277), i.e. maps are social constructions or narratives with strong moral implications (Crampton, 2001). In the context of this article, we can think of maps as commonly used tools for spatial planning and key elements for onshore wind planning of farms (Sklenička and Zouhar, 2018; Sotiropoulou and Vavatsikos, 2021) and its implications. For example, geographical information systems (GIS) can be used to create maps that highlight the cumulative impacts of land-use pressures on reindeer (Sandström et al., 2003; Stoessel et al., 2022; Eftestøl et al., 2023). For example, Sandström et al. (2003, p. 557) use GIS to gather and compile information regarding land-use activities and patterns among reindeer herders and other land users and take a “(...) novel user-oriented effort largely based on the work carried out by the principal end user, i.e., the reindeer herders themselves”. As to be expected, not all studies include the principal end-user, reindeer herders. For example, Stoessel et al. (2022) do not include reindeer herders’ perspectives in their article that maps the cumulative pressures on the grazing lands of northern Fenno-Scandinavia. As Shaw et al. (2022) demonstrate there is the possibility, even with limitations, to articulate Western systems of mapping like GIS with the communication of TEK, in the context of natural resource planning processes, making clear the power of maps to change the collection and dissemination of Indigenous knowledge.

In our case, two interviewees emphasized that, for Sámi, the natural world is difficult to map, and mapping is not an inherent part of Sámi culture. If Sámi do not contribute to maps, they are often seen as “difficult”, or “the angry Sámi”. Interviewees were also skeptical about contributing to maps for fear of them being used against them. For example, maps created with data from tracking reindeer could be used to justify further encroachments on grazing land. According to interviewees, just because reindeer have not used a pasture for several months or years does not mean they will not use it again. As Barlindhaug (2013) states that the power of maps lies in their ability to represent and create realities. The interviewees feared that maps would (continue to) tell the story of the majority culture. As Rocheleau (2005) argues there are assumed and unassumed assumptions of the dominant mapping practice. Thus, we support Rocheleau’s argument for a critical approach to mapping in which one asks pertinent questions to determine whose objective and vision are inscribed into the map (Rocheleau, 2005). Overarchingly, interviewees highlighted the importance of *process* over *product*. Maps themselves and projects that rely very much on maps, such as wind farm (or dam) planning, should then be done in true collaboration with Sámi People and, importantly, desired by Sámi People. This is also an opportunity for TEK to shape and be integrated in a way that “educates” researchers, policymakers and other stakeholders on how to see the natural world and proceed in fairer modes of action.

6 Under the lens of justice: some insights and recommendations

From the interviews, and supported by general literature on the topic, it was possible to identify all three dimensions of energy justice, as well as some ways how the Sámi People were/are being affected by the Norwegian energy transition strategy. The interviewees mentioned issues of recognition justice when they expressed how the mainstream authorities and the ethnic majority did not properly consider their culture, living principles (e.g., “leave-no-trace”) and knowledge (TEK). In the same line, the contacted herders emphasized the relevance of respect to ensure a consistent recognition of the value of their traditional knowledge. This value and recognition (in)justice were exemplified by how maps used for energy project planning and land management are elaborated. Their opinion and expertise are not sufficiently included also because of how dominant scientific and governance modes fail to acknowledge the relevance of their individual and collective experiences.

The interviewees mentioned equally issues of distributive justice probably in more subtle ways than with recognition shortcomings. To support and illustrate this claim, consider the power imbalances over what information or representation are included in maps or how the herders do not want (to continue) being excessively burdened with the negative impacts of societal (in this case, energy decarbonization) transitions. By creating physical barriers (e.g., energy infrastructures, roads) and disruptions (e.g., flows of workers) in areas of reindeer grazing, the Norwegian Sámi herders are being subjected to conditions for effective distributive injustice. It is crucial to (re-)think concrete strategies and processes that mitigate this situation by addressing both the cause (e.g., use of areas for installing onshore wind parks) and (e.g., loss of income, cultural erosion) also ways to compensate, if possible and desired by the individuals, for the burdens of the Norwegian energy transition.

Another facet of the distributive tenet of justice referred to by herders was in the form of the value of power. In the case of this article, building and using maps in the context of communication of TEK revealed how it can be a struggle to integrate Indigenous know-how in these planning tools, also because Western and Indigenous Knowledge are not always easy to reconcile. Still, scientific outcomes and scientific depictions hold extensive power and influence in decision-making that ultimately will influence the areas left for grazing.

Finally, the Sámi interviewees highlighted the importance of the participatory process in clear reference to participatory justice. Designing inclusive participatory processes, especially given a history of exclusion, can be challenging, with many stakeholders rightfully hesitant to participate. Still, it is possible for policymakers to design and reinforce processes that ensure and facilitate adequate involvement of Indigenous People (and other minorities) in cases such as (e.g., public) research and governmental-supported and regulated business activities as mentioned previously. In direct relation, this study highlights the importance of these processes being based on principles of trust, and respect and that work to counteract power imbalances, especially those that are inherent when working with Indigenous Peoples. Communicating knowledge about the barriers facing reindeer in nature through

maps can be an especially sensitive topic. Overarchingly, there was a fear that maps, even those that depict barriers to herds' movements, would be used as justification for further encroachment on reindeer grazing land, rather than helping to protect the sustainable management of land. This skepticism highlights that there is much work to do concerning creating spaces that facilitate participatory processes that are built on trust and respect and designed in ways that allow for co-creation and collaboration.

Given that Norway and other Scandinavian countries are at a crossroads in the deployment of green energy projects if the Paris Agreement goals are to be achieved, it is crucial to remember the UN principle of "leave no one behind" and ensure that the energy transition a fair(er) process and that does not emulate the systemic injustices suffered by Indigenous Peoples. As the Sámi interviewees referred, concepts like "leave no trace" can be key to a secular and deeper understanding of sustainable transitions, which can in turn influence the way energy projects and initiatives are designed and implemented. Mitigating human interference in the environment at all stages of energy projects and initiatives is not a "new" concept in the strictly scientific arena, still it can make a remarkable difference for cultures like the Sámi. If the principles of energy justice were to be systematically applied to this group, there would also be improved conditions for TEK to be communicated and shared, which would be positive not only for the Sámi herders but ultimately for all of society.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the National Research Ethics Committees | Forskningsetikk. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required from the participants or the participants' legal guardians/next of kin because there was an oral agreement with the participants in connection with the type of research methodology. The outcomes of the research were reviewed by the participants. Furthermore, this research was one of the parts of large project activities that had obtained consent for their activities.

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RV: Conceptualization, Investigation, Writing – original draft, Writing – review & editing, Methodology. AG: Methodology, Writing – original draft, Investigation, Writing – review & editing. TL: Investigation, Methodology, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

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