

In the Reindeer Forest and on the Tundra. Modern Reindeer Management and the Meaning of Local Ecological Knowledge

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Reindeer herding is a natural source of livelihood, which during recent decades has had to adapt to both external and internal transformation. Many of these changes have been directed at the environment in which reindeer herding is practiced. Other interest and user groups have moved into the same areas with needs that differ from those of reindeer herders. The reindeer herding working environment is called the *reindeer forest* in Finland, whereas it is *tundra* or *taiga* in the reindeer herding communities in Russia. In humanistic sciences, such as ethnology, nature and environment, it has become an object of several studies. Also, the meaning of these concepts is under lively discussion. In ethnology, nature and environment can be seen as cultural concepts; they are culturally constructed and defined. However, nature also exists without our cultural constructions and classifications. Different groups use and understand these concepts from their own traditions and perspectives. These concepts are not even known or used by all. The significance of nature and environment comes to us via the experience of use and cognition or concepts, i.e. understanding, classifying, thinking and perceiving senses (Ingold 1992: 115; Ellen 1997: 3). A descriptive example of this is how the reindeer herders incorporate the qualities of productive land and pasture into their geographical names.

By managing and possessing the environment I mean, besides concrete use – walking amongst nature and exploiting its resources – also the mental management and possession. Mental environmental management

means knowledge about the environment; to know this and to possess different skills to use it and manage there (Bromley 1991: 22; Oksanen 1998: 80–81). To manage the environment is different depending on the sources of livelihood. In this article, I will study how different groups can take control of different areas in different ways. However, it is not my purpose in this exposition to slice up the environment, as a subject for study, into a domain consisting of too many user groups, because I shall later focus on the reindeer-herding environment from the viewpoint of the reindeer herder. What does the environment consist of, and what sort of control does the reindeer herder have over this? Finally, I consider the various forms and changes, in traditional environmental knowledge, related to reindeer herding. The importance of traditional local knowledge is still great, despite development in technology and other changes, because it is through this that the reindeer herder is able to control the reindeer forest, tundra, or taiga, being the herders' own working environment. I have studied reindeer herding in two different ecological areas and societies, that of Finnish Lapland and of the Kola Peninsula in Russia.¹ The reindeer herders' association, *paliskunta*, of Kyrö is situated in the fringe area of Sápmi² and Finnish Lapland. The majority of the reindeer herders are Finnish and the Sámi reindeer herders speak Finnish as their mother tongue. The reindeer herders of Kola belong to three main ethnic groups: Sámi, Komi and Nenets.

We experience, observe, and treat our environment in many different ways. On the way, based on activities and usage, the method is to divide the environment into living, working and free time environs. If we take the work environment as a case in point, which is that the environment, in which the individual is working, his realm of knowledge and environmental experiences form a part of the essential research materials. This subjective information, a compilation of knowledge received through enculturation, one's own experience, impressions, values and beliefs, influences the use of the environment and also is reflected in relations between the individual and the environment. Growing up in a particular

¹ This paper is based on my PhD-thesis on reindeer herding in transition. See Ruotsala 2002.

² Sápmi (Sámi land, Lapland) is the area which is traditionally inhabited by the Sámi people. It is called the home territory of the Sámi. Sápmi crosses the borders of four nations, Finland, Sweden, Norway and Russia and it includes the northern parts of Scandinavia and Finland with the Kola Peninsula in Russia.

environment, we receive, as a “legacy”, the knowledge of how to benefit from the resources of that environment. We also receive the cultural pattern of how to experience, appreciate and interpret our own living environs. We see our environment or landscape through our own cultural filter. To outsiders, for example, to hikers from the south, Lapland’s mountains, in Finnish *tunturit*, mainly give aesthetic experiences, or a feeling of victory, in conquering the top of the mountain. To local reindeer herders, who have worked, sweated and frozen there, the environment has, however, another meaning. The empirical experience has a decisive role; this is only revealed through their personal experience and knowledge (Sarmela 1994: 53–54; Anderson 1996: 96).

Local inhabitants and visitors experience place and landscape in different ways, and this has been studied e.g. in human geography, where landscape is an important concept. A landscape is understood either as an area, which is limited by certain criteria, a subject of protection or planning or personally as a part of the subjective experience world (see, e.g., Karjalainen 1996: 8–13). Ethnological studies emphasize that the landscape is both in our minds, and is also a physical reality and so we have to study the relationship between the physical and mental landscape.

In recent studies, such concepts as space and place have been widely used. Space is regarded as a multidimensional and ambiguous concept, which can refer either to an astro-space or a bounded physical, geometrical and material space. It is also connected to locality, width and situation. A space can even contain many aspects and can include and bear cultural meanings. Space is abstract and empty. Environment, on the contrary, is not ready, but it is a relational concept for those whose environment is the target of the study (Ingold 2000: 20). Matti Sarmela has critically commented that, often when space and environment are used in the studies concerning worldview and mentality, the knowledge about everyday ecology and ecological conditions is missing (Sarmela 1994: 107).

Place transforms personal space. Yi-Fu Tuan (2001: 12) sees that the personal relation to the environment – where she/he knows to belong – is more important than the physical situation. Images transmit, beside personal experiences and memories, also information about the place. When we are studying the memories concerning places, we have to keep in our minds, that these are interpreted from the present. In spite of all the changes that have happened in these places, time often “gold-plates” the memories. Places get their special meaning through different situations in life and the meaning can even change according to age and time.

In my study (Ruotsala 2002), I have used the concept of environment,

because it also includes the collective relationship of environment and our experiences. The concept of perceived environment of cultural ecology corresponds with the meaning of landscape. In this article, it equates with the reindeer herder's environment.

From reindeer forest to wilderness

On the linguistic level, outsiders and reindeer herders also distinguish the same places and areas. When the local people are speaking about reindeer forests and their different pastures the tourists or authorities are speaking about wilderness. How does wilderness differ from the reindeer forest? Wilderness is a cultural- and value-bound concept, which has several meanings. For different groups it means different, even opposite things. Wilderness is connected with Lapland both in tourism and several studies, although the concept of wilderness does not belong to the vocabulary of reindeer herders, especially Sámi reindeer herders. Wilderness studies exclude culture outside the wild, almost tamed wilderness (Nash 1982: 233; Saarinen 1999: 84). Human beings, with their traditional functions, belong to the Finnish wilderness, but the questions, as to who really belongs to the wilderness, which persons can use it and how it can be used, differ.

The wilderness law opened a discussion and created studies on the content and use of wilderness areas. In the discussion, there are to be seen two ways to interpret what a wilderness is and what does belong to it. The local empirical wilderness interpretation differs from the translocal wilderness interpretation (Valkonen 2002: 43–55). In Lapland, demands have been still more strongly presented as to how to limit or forbid the local and traditional ways of using the wilderness, such as reindeer management, hunting, and fishing in the name of environmental protection. On the whole, the concept of the wilderness can be seen as ethnocentric and without history because it does not take into consideration those who have already used it, but emphasizes the integrity and uninhabited nature of the area. The significance of the wilderness is different for the local inhabitants, because these areas which now have been labeled as wilderness, have belonged to the traditional Sámi villages, *siidas*. They have neither been uninhabited, nor separately as loose places, but these others' wildernesses are cultural environments where human traces are visible. The use of wilderness is an essential part of everyday life; it has been our "lived space". On the other hand, more attention is now paid to the significance of the locality and local needs in the environment plans and the need to take local voices into consideration has

been emphasized in the environmental use and planning. Most of the demands are aimed especially towards the Finnish Forest and Park Service, which controls the majority of the wildernesses of Lapland.

In this discussion concerning the wilderness concept – whether it is local or translocal – the core question is also to whom these areas belong, who may use them and to what purpose. Can different purposes be preferred/ranked? The classifications concerning the utilization of nature restrict the possibilities of local people. The local ways to use nature, which does not belong to natural sources of livelihood, tourism or industrial use, are understood as recreation use and in the recreation use local or other users are not regarded as separate groups. The important criterion in this discussion has been the so-called uninhabitedness and the need to preserve it is caused by the tourism functions of wilderness. In tourism, a wilderness can be either a silent or a service wilderness. The silent wilderness belongs particularly to the tourist's or environmentalist's area and according to a report (Kajala 1999: 118) more than even half of the tourists experience that they are being disturbed when meeting, in the wilderness, other people, who especially use such motor vehicles as a snowmobile, a four-wheeler, or a helicopter. The majority of these people are local inhabitants, reindeer herders, fishers, hunters, or the staff of the border guard detachment. Different services, for example, cottages, saunas, hiking routes, bridges, and campfire places, are built for the needs for tourism or environmental protection.

When the tourists arrive in Lapland and its wilderness they make the journey both in space – from south to north – and time, because Lapland is seen as “a past in the present” (Knuuttila 1994: 124). A modern reindeer herder, who uses modern technology, who is dressed in goretex clothes, drives all kind of terrain vehicles and is living in a modern house, does not fit in with this romantic picture held by tourists. To meet such a modern nomad in the wilderness can cause disappointment. Although a reindeer herder uses this environment for his daily living, his actions do not fit in with the picture, which is given about him to the tourists.

Locality does not alone define wilderness and the local opinions about the wilderness are not seen as alternative uses of wilderness or to define it (Valkonen 2002: 51–52). The silent wilderness or wilderness as a tourist area are self evidently seen as alternatives and for these purposes it is justified to control the functions of local users in wilderness. The conservation of wilderness needs concrete acts, which show related value – whose needs are more preferred than others. E.g. the cabins, which are built for reindeer herders, hunters, fishers and hikers, have now been

pulled down. The purpose of this is to limit the unwanted use of wilderness, but as an act it tells more.

How to look at the reindeer forest?

The reindeer herder's environment can be explained from two perspectives. The starting point for this is that environment sets the borders, according to which a human being makes her/his cultural choices. This is how we can understand how the environment impacts reindeer herding in different ecological areas as in the forest or on the tundra.

Firstly, we can evaluate what does the environment mean to the reindeer herder and what different kind of work activities or meanings does his environment contain, and what exploitable resources are included in this reindeer herder's environment. The relationship between that individual and the environment may be examined in two ways. Partially, the environment is influenced by how the individual exploits it, – i.e. the material part – and partially by how our environmental impression influences cognitive and symbolic ability – i.e. the spiritual and intellectual part. It is not necessary, nor is it desirable, to distinguish these two positions, the material and the symbolic or spiritual, in the environment (Ingold 1992: 53; Addison Posey 1999: 4–5). It is important to remember the reciprocity, which is included in the reindeer forest; methods of how to behave in reindeer forest have either a concrete or symbolic impact on the environment.

Secondly, the reindeer herder does not use his environment alone, other parties – actors and users – must also be taken into account in this environment. A question is what needs do they have in their relationships with each other and reindeer herding? Are their activities in harmony or conflict with the environment? At the same time, we could also use various other labels, such as productive environment, recreational environment or experience environment, and ask what are the relationships between these environs.

It is well known that profitable reindeer herding requires a special knowledge of the environment as well as a sense of responsibility for it. The work of the reindeer herder is guided by his knowledge of the environment. Different environs require different kinds of knowledge on how to manage and use them. It means that a reindeer herder must be a professional if he wants to be able to exploit the natural resources of his environment. This does not change even though the environment around him may change. His knowledge comes only by adapting to changes and in this crucial situation research also enters from the outside. He must be able

to react and make decisions based on his professional skills also in new circumstances. For example, in the winter 1996–1997 reindeer herders had to make decisions that influenced how the reindeer would survive the harsh winter; would they bring the reindeer into fences, and if so, then when? Where these fences should be made? Where would they get extra food and how should it be given to the reindeer, some of which were already in weakened condition? Another important skill to learn is how to cope with media attention that would blame reindeer herders whenever a predator happened to make a kill, whenever overgrazing occurred or reindeer starved. E.g. according to the environmental review of the OECD too large reindeer herds is the greatest threat for the ecosystem and biodiversity of forests in Lapland (OECD 1997: 98, 142).³

The components of the reindeer herding environment

Reindeer forest or tundra is a place of many environments and all kinds of resources. It is also a concept with which the reindeer herder has taken his own working environment in his possession. In reindeer herding, the meaning of the forest is a more ambiguous term than the word of the standard language because the forest can be also treeless because there the reindeer forest is also situated on treeless tundra on the north side of the conifer limit. The different tasks in reindeer herding such as marking calves, collecting reindeer, separation and herding are made either in the *reindeer forest* or merely in the *forest* even if the work even takes place factually, for instance, on the tundra or on the mountains. The same area, reindeer forest, can also be used for other purposes, such as a bird forest, elk forest or berry forest. Tim Ingold (2000: 177, 199) has used here the definition of taskscape.

In Russia, for example, on the Kola Peninsula the term, which corresponds to the reindeer forest, is tundra. In ecological or botanical geography it is defined as a treeless area, but in everyday life and in reindeer herding tundra means a place, where reindeer herding work is done. In other words, tundra refers to that environment, space or landscape from which people earn their living. For them the tundra always

³ See more these kind of articles: Tahkolahti 2001: A11; Väänänen 2001; Karhun palvelus (jälkiartikkeli) 2001; Karhun salakaato Inarissa on suurempi uutinen kuin miestappo Hämeenlinnassa 2001.

means a non-built up space, not controlled or measured by the administrative power.

As already stated, the reindeer herder's working environment consists of, depending on the resource to be used, many different work environs distinguished one from each other by different definitions. The names refer to the activity. In addition, time will affect the assignments and the definition, however, in turn depends on the task because when the picking of the berries is taking place in the same regions, being the *cloudberries*, *hillassa*, the *blueberries*, *mustikassa* or else *gathering shoe hay*. Gathering feed for the animals by stripping off birch leaves or making bunches of leaves is done either in the *leaf forest* or the *leaf bundle forest*. Based on the fishing methods one speaks of setting out the *nets*, *seines*, or *jigs* etc. In the autumn, the same place will serve as a *lintumetsä*, bird forest or *hirvimetsä*, elk forest. The place may happen to be the same or nearby, and the practised operation determined different naming.

The same environment, of course, may even provide recreation for the reindeer herder; one is "released to the mountains". The motor sledging is important for the locals even though one does not want to interpret it as a hobby, which the tourists consider it as. The local people do not usually hike on the mountains without a proper reason. The mountain is not visited because of beautiful landscapes. In many descriptions of Lapland, the authors indeed reveal how they have wondered: who is crazy going on foot to the mountains and even without cause?

In the reindeer forest, in addition to the working environment, other environments can also be found. Earlier the reindeer herders' relationship to the environment contained many features, which now are considered mystic. The folk religion has been used in the protecting of the environment and teaching and transferring traditional environment knowledge to the next generations. Particularly, the success of the reindeer herd was vital and it has determined religious behaviour. It includes, for example, the seeing of omens and the performing of certain rites to reach "reindeer luck" in order to secure survival. Reindeer herders have not been passive harvesters but engaged in the complicated business of maintaining the world around them to ensure that its produce is bountiful. Food is secured through the respect that herders and hunters show to the land in general and to the animals in particular (Brody 2000: 112–113). Herders and other people, earning their living using natural resources, understand very deeply the reciprocity between the environment and their own ecological behaviour. However, there are also examples how the reindeer herder's empirical traditional ecological knowledge may be different from

his actual ecological behaviour, which may be in conflict with nature's carrying capacity (Krupnik 1993: 233–39).

Seitas, sacred places of worship have been an essential part in the reindeer herders' environment. The sacred places still have an influence, although they are not either generally mentioned or told to outsiders. This environment can also be called a mythological or ritual environment. Swedish ethnologist Rolf Kjellström (2000: 66–68) calls this a landscape of feelings. In turn he includes, for example, the sacred places of worship and memories which are related to the different events in a historical environment.

Even moving about without company the reindeer herder was by no means alone, because in the reindeer forest, as an essential part, belonged supernatural beings, such as the spirits, *haltija*, gnomes, *maahinen* and goblins, *staalo*, for which the oral tradition has been kept alive up to the present day although the rational worldview has displaced these beings gradually. Nonetheless, a cautious attitude is still taken towards certain places and things. One does not camp or make fires on a trail in order that gnomes may come and go in peace. Building fires and making coffee are linked to other beliefs; as an example the cooking may not be taken from a growing spruce tree, but preferably from a birch or a spruce tree that has fallen to the ground. Otherwise, there will be a fear that you will lose your personal reindeer luck. These kinds of beliefs connected with the reindeer luck still exist, although my informants told of them with a smile on their face. E.g. the reindeer meat must not put into an empty pot.⁴

The historical environment is another of the reindeer herders' environs and it pertains both to the choice of profession and passing on of the profession. Often an important factor is that this is a profession passed down from one generation to the next, primarily from father to son, which is carried on in the same place as the previous generations. In Lovozero on the Kola Peninsula, a young reindeer herder chooses his brigade on the basis that the brigade's pastures formerly belonged to his parents' and grandparents' *siida*. Another middle-aged reindeer herder spoke about his brigade: "There on the shores of this lake my grandfather and grandmother are buried. It is my home region."⁵

⁴ TYKL tutkimusarkisto 1.6.27/3b, 5b, 12, 13.

⁵ TYKL tutkimusarkisto 1.6.27/5o.

The significance of the reindeer herding environment reaches more widely than only to the reindeer herding families because the local historical significance related to it is important to the identity and personal well being of the individual. It helps younger people to see and to appreciate the work of the previous generations. This nearby environment linked to oral tradition is transferred to the children.

The location and existence of an environment or landscape are not essential, but its significance is, because the environment or the landscape can be also invisible or merely as a memory. For example, the places, which have been submerged by water regulation or left under construction of roads or settlements, are still such significant places. Either ones' own or ancestors' memories, connected to these places, have been told to the next generations.

The traditional environmental knowledge in reindeer herding

The reindeer management, as well as other natural sources of livelihood in the north, have been based on the scope of the enjoyment area and on higher mobility.⁶ These in turn have set special demands for environmental knowledge. The different environments require different information about how they are controlled and used (Ruotsala 1994: 63).

A cognitive map can be used to clarify the individual use and moving of the environment. The cognitive map contains the internal models, images and experiences, which direct the action of the human being (Greverus 1994: 51). The members of a community, who do not know or have maps, have learned to control their environment from a memory, with the help of their empirical experiences. They construct their environment as a network of places, which are in a hierarchical relation to each other. The information concerning the environment is comprehensive. The precondition for knowing the environment and finding the road is going and moving by yourself. The terrain has been taken into possession and has been mapped mentally by going .

Hugh Brody (2000: 107) has described the hunter-gatherers' area, that "this was a place with no beginning and no end. Something such as the world of hunter-gatherers' seems boundless, reaching seamlessly into the distance and the very distant past." According to Anna-Leena Siikala, the

⁶ *Nautinta-alue*, enjoyment area refers here to the area of "positive prescription based on immemorial use."

sphere of activities in natural sources of livelihood is widely perceived and the directions, the significant places and connections such as paths, roads and water routes are more important than its borders. The paths and roads – as well as waterways – serve as the routes to connect the important places for maintaining of life. They also form an area, which is loosely known compared to more strongly perceived space (Siikala & Ulyashev 2002: 164; see also Weiner 1991: 37–38).

Reindeer herders and other people, who earn their living from the natural sources of livelihoods, manage this area cognitively and they know how to move there, whether it is a mountain, tundra, forest or waterway, but the authorities are not satisfied with this information. They need maps to control the area. If there are no maps available, they have to be done.⁷ Also maps have impact on, and can change, a landscape because they are used as tools designing projects which change, for example, the environment such as the building of water ways, natural parks, felling or land sales.

Environmental knowledge and efficient utilization of wide areas form the basis of reindeer management. Because the reindeer's annual habits will become familiar to the reindeer herder along the years, he has learned to follow them and the reindeer's natural instincts in his work. These include attempting, among others, to reach the traditional calving areas during the spring time, talent to *palkia*, to stay in certain areas without herding during certain seasons, talent to go to the contrary wind, talent to *tokkautua*, to form herds in order to protect from the mosquitoes and in autumn the rutting season, *rykimäaika*.

In spite of the fact that reindeer management, and the environment where it is practised has changed, the significance of local knowledge has not disappeared. The different environments require different information about how the environment is governed and used. The reindeer herder must also control his environment, when driving a snowmobile, a four-wheeler, travelling by helicopter, as he did earlier when he was walking on foot or driving with reindeer or skiing. When engine powers are used, the observations of the environment changes because the vehicle moves fast and it is loud. If it makes extra turns or even gets lost in the terrain, the trip still remains fast with the machine getting to the right route. During walking or skiing the terrain was observed in a more detailed fashion, as if

⁷ See symbolic maps of the Kola Peninsula in Robinson & Karim-Aly 1998, *passim*.

it was “closer”. The time used for travelling has also significance regarding the depth of observations. You experience the environment with your own body and thus also the means and modes of transport affect the individual experiences and further on the observations. The smell of the petrol of the snowmobile conceals, for example, the scents in spring and the voices of the environment.

The snowmobile, mountain bicycle and four-wheeler have distanced their drivers, more symbolically as concretely, from the environment because with their help you can get quickly and easily “to nature”. When a helicopter is used, already the perspective changes, the environment is looked at from above, from the air. The landscapes are passing faster than when using skis or going on foot. The animals also might easily be scared the sound of the motor. When driving a four-wheeler you do not need to find dry routes over the swamp because a four-wheeler can move over wetter places. But its traces stay on the landscape for a long time. Also, the environmental change – new roads and routes, water regulation, felling and forest cultivation – must be taken into consideration. An already retired reindeer herder emphasized the significance to learn to know the terrain and its changes. You will learn to go in the terrain only by doing so. He said that the felling and cultivation might change a landscape so much that you will not even recognize it again. According to him, you have to keep in mind the features of terrain very carefully if you have been walking or skiing there.⁸ For younger reindeer herders, the place names might stay unknown when they are following older reindeer herders in a foreign terrain, because driving a snowmobile or a four-wheeler is fast and it is noisy and you easily forget to ask or tell the names. It is also true that some people know better how to walk in nature and to read the environment like others. Even though the older men guide the younger, all do not learn to manage in nature.

The knowledge, which is related to natural resources, is of two kinds and they differ from each other in spite of the fact that both in principle are based on the systematic collecting, classification and handling of empiric observations. Furthermore, and sometimes opposite to, the academic scientific or western knowledge which the authorities and researchers produce, there also exists traditional and local environment knowledge on which the local people establish the practicing of the natural sources of

⁸ TYKL tutkimusarkisto 1.6.27/9.

livelihood. Its task is, for its part, to secure the continuity of the community. Even though only a few of the members of the community are experts in environment knowledge, it is holistic and social; it belongs to the whole community (Eythorsson 2001: 20–24). However, everything is not always conceived for others. The environment knowledge can also be hidden because the information signifies power. The best berry picking and fishing places, the nesting areas and the sacred places are often kept as personal information. The reindeer herders' knowledge also differs from the environment knowledge of others, as the neighbours, who work in other professions, do not need that information. Part of the environment knowledge is tacit knowledge, which is learned by following the signs of the nature and the animals' behaviour. All senses, the sight, the sense of hearing, the sense of smell and the sense of feeling are important in tacit knowledge. The knowledge related to the weather can prove to be sometimes even strategic and vital and therefore one wants to know the changes in the weather already beforehand. The snow must be tried so that you can recognize it and feel its composition or quality. However, this knowledge cannot always be explained but it must be learned by trying different ways. It was also difficult for a young reindeer herder whom I interviewed to explain how to choose the breeding reindeer or female reindeer, which will use the bells in the herd:

You see when you look at the reindeer. I can't explain it. You will see it. To good reindeer cows. It is just like a leader reindeer. I can't say it, you will learn to know it by doing. You will learn to know your own reindeer. I have a good visual memory.⁹

There are different kinds of environment knowledge. A successful reindeer herder has many kinds of knowledge but the visual memory is an important part of it, among others, the individual reindeers' identification and identification of signs. The knowledge concerning the knowing of the terrain and reindeer pastures is wider. The excellent expert of reindeer marks or terrain expert is not necessarily skilled in the reindeer forest because physical labour and ability demand different skills. Other persons in turn are more skilled in animal handling: to teach reindeer to *lajijstaa*, to follow by leading and to become a good driving reindeer, *ajokas*. They

⁹ TYKL tutkimusarkisto 1.6.27/14.

identify which reindeer would become good leaders of the herd and which reindeer, however, would be good to follow the others in the herd. Other herders are good at recognizing the earmarks thanks to their good sight and memory, and the others, however, are physically stronger in the work in the reindeer forest (Paine 1994: 22–24).

Every reindeer herder's ability, skills and workings in the reindeer forest are the results of long training. In addition to the concrete skills and properties, also the feelings and sensitivity, a kind of intuitive learning and operating, ability to receive and to read the feedback given by the environment are a part of this environment relation. David G. Anderson (2000: 116–117) uses the concept of *sentient ecology* when he is referring to the environmental relation of Evenki hunters and herders. When Evenkis are moving and acting on the tundra, they are aware of the fact that the environment and the animals answer them and their posts. Hugh Brody (2000: 126), for his part, tells how Dunne-Za, like other hunter-gathering peoples, use dreams to locate both the animals they kill and the routes along which they must travel to find these animals. Their system of dreaming allows memory, intuition and facts to intermingle.

The fragmentary quality of the scientific knowledge is regarded as the essential difference between the scientific knowledge and the traditional environmental knowledge. The following features are typical of traditional environment knowledge: 1) it will be classified often in a different way than so called scientific knowledge; 2) it is usually unwritten; 3) its definitions refer to everyday life and everyday use; 4) it refers often, but in a different way to time and place than scientific knowledge; 5) it is holistic and social and belongs to the whole community, even though only some of its members can be experts; 6) it is learned by practicing and by imitating other members of the community; 7) its features can be mythological (Addison Posey 1999: 9; Eythorsson 2001: 20–24).

In spite of the fact that lots of studies regarding traditional environment knowledge have already been done, it is justified to ask if these studies have really had significance for the “owners” of the traditional environmental knowledge? Is the traditional environment knowledge further taken in earnest as the basis of the reports and studies, and finally to the basis of different decisions, or does the monopoly of mainly natural scientists still continue? Paul Nadasdy (1999: 3) who has studied Inuit communities, argues that there are still many different opinions about the role of traditional environmental knowledge. At the other end of the scale there is an opinion according to which the traditional environment knowledge is only used as a political intrigue invented by the native people, with the

help of which they are able to snatch the control of environment resources from the trained scientists. The same opinion is also represented by the ones to whom the traditional environment knowledge in the research plans only creates an entrance ticket to fieldwork regarding the communities of indigenous peoples.

In a similar way, the area ecological plans of the Finnish Forest and Park Service can be criticized. These plans are based, among others, on the discussions where the local people could take part and explain their needs and views. According to the reindeer herders these opportunities have had no practical significance because their views have not been taken into consideration in the plans. When plans are discussed, the reindeer herders and other locals can affect only the details regarding the emergence of felling. The important principal questions, such as of actual cuts and financial goals, are left outside the discussions (Raitio 2000: 59–60).

Could the traditional environment knowledge be the reason for the taboo rules and beliefs of the community? One of the fairy tales of the Kola Sámi namely forbids letting the reindeer graze in the areas where eudialyte, *the blood stone* is found. According to this fairy tale, the red streaks on this eudialyte stone are the blood of Sámi, who were killed by the *tsuudi*, who attacked to the Kola Peninsula. The Sámi have avoided herding their reindeer in the regions where this *blood stone* occurred because they considered those areas dangerous (Fersman 1974: 16).¹⁰ Is there a natural scientific or geological explanation to be found for the grazing taboo? Eudialyte itself is not a dangerous mineral although the radiometers react to its radiation. It is found on the Kola Peninsula, especially on the Hibinä Mountains and in Lovozero. Eudialyte can appear near extremely radioactive elements, such as uranium and thorium, and in a certain geologic process these elements have been separated from the grate of mineral. Thus eudialyte can indicate abundant occurrences of uranium and other radioactive elements in some places. What is the origin of this fairy tale? Have the Kola Sámi noticed that the reindeer do not feel well on these places, calving does not succeed or the animals are restless? The local inhabitants have also stated that in certain places on the tundra of Kola the visitor feels so unpleasant that she wants to leave immediately. It is difficult to explain this unpleasant feeling but is its background the same phenomenon that which David G. Anderson (2000: 116–117) determines

¹⁰ TYKL tutkimusarkisto 1.6.27/66.

as a sensitive environment relation of the Evenkis. Other people experience the environment more sensitively than others.

Weathers and climate change

For successful reindeer management an important part of the reindeer herder's work is, already as a young herder, to learn to identify nature signs, to predict the weather and to follow the variation of the seasons in the environment (see, e.g., Huuskonen 2004). The reindeer herder had to know how to go in different environments during different seasons in different conditions. In a thick fog, *murkku*, the environment looks quite different than in clear air. The knowing of nature signs and the predicting of the weather facilitate work and even may save one from death. If a southerly blew snow from *hanki*, hard snow, the thaw was coming. The jumping of reindeer predicted the snowfall, *pyry*. By following nature and the weather, the reindeer herder knew where he could find the reindeer after the north wind and on which tops of the mountain to collect reindeer for the summer calf marking and in which regions to begin to collect the reindeer in autumn after the rutting season. The reindeer herding work is based on the fact that human beings have learned to utilize the animals' behaviour. For example *räkkä*, the period of mosquitoes moves the reindeer to a herd on high mountain areas because in the wind the mosquitoes do not hamper so much. The mechanism, with which the joining the reindeers' herd reduces drawbacks of *räkkä*, can not, however, be explained totally with the methods of natural sciences. The human being has learned to utilize this natural phenomenon of the reindeer. Still the reindeer will further be found on the basis of the weather:

From the weather. If the sun shone, they went up on the mountain, and if it rained, they were resting in a spruce copse. (—) This was how it happened, it was depending on the weather. They searched from where the wind came. (—) The reindeer wanted to wander against the wind when there was a lot of räkkä.¹¹

The following of climate, weathers and their changes is an important part of the reindeer herder's environment knowledge. Middle-aged and older reindeer herders have an experience of several dozens of years to follow these. They have followed the changes in the direction of the pacifying of

¹¹ TYKL tutkimusarkisto 1.6.27/9.

the winters and of the cooling of the summers. In the 1990s, there were several snowy winters. Thick snowy mild winters are bad for calves. In 1996, it snowed during two or three days in late winter leaving almost one meter and the reindeer were not able to find food under it. Then reindeer had to be fed either in fenced areas or in the terrain. In the following summer, fewer than half of the female reindeers gave birth. Even the following reindeer herding year was bad in Kyrö because in the early winter, *syystalvi* 1996 it was snowing on an unfrozen ground, the unfrozen lichen under the snow moldy and nearly all the reindeer should be exceptionally moved to the enclosed feeding areas or they should be fed in the forest. According to the reindeer herders, the reindeer smells a moldy lichen and they do not start digging it. In snowy winters, the reindeer would have to be in especially good condition so that they are able to dig the lichen from under the thick snow.¹²

The climate change perceived by reindeer herders – mild winters with a lot of snow have become common – have now been studied by natural scientists. This phenomenon is called the NAO phenomenon (North Atlantic Oscillation) because the locations of low and high-pressure areas in the North Atlantic affect the severity of the winter. When the west winds dominate, the winters are mild and rainy and when the eastern winds dominate, winters will be cold and with little rain. The weather variations caused by the NAO phenomenon can explain, at least partly, the failure years of reindeer management, which have taken place at the end of the 1990s (Helle, Kojola & Timonen 2001: 76–79).

The weather changes do not apply only to Finland's reindeer herding area. The slaughter time of the reindeer herding brigades, of the cooperative *Olenevod* in Krasnoshelye on the Kola Peninsula, has been transferred from November to December during recent decades because, in November, the weathers have been too mild for the slaughter. According to the reindeer herders of the Kola Peninsula, the warming of the winters has begun since the end of the 1970s. In the reindeer herding area on the Kola in the inner and eastern parts of the peninsula there are plenty of lakes, rivers and wide swamp areas. The mild weathers in early winter have also hampered the collecting of reindeer because it is difficult to go in the terrain if the swamp areas and waterways are not covered with ice.¹³

¹² TYKL tutkimusarkisto 1.6.27/66.

¹³ TYKL tutkimusarkisto 1.6.27/29.

Place-names as descriptions of the environment

When moving in the reindeer forest it is important that the numerous places in the terrain, such as swamps, *jänkät*, tops, *kerot*, valleys, *kurut*, small lakes, *lompolat*, rivers and creeks, must be separated from each other both in terrain and in speech. In the place-names is seen plenty of terminology which is related both to the reindeer management and to the older hunting period, as *Hangasmaa*, *Hangasjärvi* or *Kaarrejänkkä*. *Hangasmaa* and *Hangasjärvi* are named according to the deer hunting – *hangas* means a trap. In turn, *Kaarrejänkkä* is named according to *kaarre*, a reindeer enclosure at the edge of the swamp, *jänkkä*. A lot of places with beginning of *kiekerö* also are found, for example, *Kiekerökuusikko* and *Kiekerömaa*. In Kyrö *kiekerö* means a pitted snow ground where reindeer have dug lichen. From the place-names, a respectful and aesthetic relationship to nature can be still conveyed. Monchetundra on the Kola Peninsula means a beautiful mountain in Kildin Sámi, but now the mountain slopes have been hollowed out and around the Monchegorsk Mining Center, which was named according to the mountains, nature is dead.

The place-names tell about both the history of the area and its use and users. Place-names also tell about the recent history and it was also possible to name different places of terrain according to events or persons, which are related to the place. They are “thick” descriptions about the environment and place. The place-names have even been called the mental encyclopedias of its users’, the corresponding encyclopedias exist also from the species of the environment (Maffi 1999: 28). The oral history forms the basis of traditional environmental knowledge and its management. To facilitate environmental management, places were named according to their typical features, such as *Hirvhanrykimämaa*, which means a place where male reindeer were gathered during the rutting season. Because the reindeer were roaming freely during the summertime, there are fewer names of summer pastures than of winter pastures. Some of the names do not tell of anything today, because the nature of these places has been changed. E.g. *Aihkiselkä* is now totally different than when it got its name. *Aihki* means an old pine tree. Clear felling was done in *Aihkiselkä* in the end of 1970s but the name is still in use. When the significance of the place changes, the name will be preserved: the name of *Kirkonmaanrimpi* is still used, although it got its name from an old temporary winter graveyard place and this swamp, *rimpi* has been a field already for dozens of years.

The reindeer herding vocabulary

The link between language and culture is important at many levels. Language tells a lot about an environment, its resources and use. Remembering and new significance and reality are reproduced with the help of language. Also the traditions connected to the profession are transformed by folklore from one generation to another. When the younger generations on the Kola Peninsula can no longer speak Sámi or Komi, as the previous generations did, this has caused a disappearance of traditional environmental knowledge of reindeer herding.¹⁴ Earlier, several reindeer herders were bilingual or could speak even three languages; Sámi reindeer herders knew, in addition to Sámi, also Komi and Russian and the Komi, in turn, Sámi and Russian languages. Of course, the Sámi languages – actually there have been four different Sámi languages – are still preserved in place-names, even though Sámi or Komi are no longer used as a working language on the tundra. Language can be preserved also in symbolic, political or ceremonial use, in spite of the fact that it is no longer used for communication or is not understood.

There is a threat that when language becomes poorer and is disappearing, this means that cultural diversity will become poorer and even disappear. Luisa Maffi (2001: 413–414, 418–419) has remarked that even though much attention has been paid to traditional environment knowledge and use of the natural resources and in that way the language is in a key position in creation, storing, and transferring the traditional environment knowledge, there is not enough attention paid to protect small and endangered languages. The disappearing of languages and cultures, or ethnic groups and their traditions, is not seen as being as serious as the impoverishing of the biodiversity of nature (Pawley 2001: 230; Skuttnabb-Kangas 2001: 397–398). However, linguistic, cultural and biological diversities are dependent on each other. The preserving of the linguistic and cultural diversity should be included in biological protection programs. Several studies show how the indigenous communities and other ethnic groups are some kind of reservations which preserve traditional knowledge about rare, endangered and indigenous species, their properties and possibilities for use, of which even the biologists have not a clue (Nabhan 2001: 151).

¹⁴ When the Komi and Nenets arrived in Kola, in the end of the 1880s, it was evident that the Nenets could no longer speak their own language.

The scope of the lexicon, concerning the source of livelihood, tells the how important is the position in the area. As classical examples have been used the terminology of sand used by Bedouins, the ice and snow terminology used by Inuits and Sámi. In the reindeer herding communities, there are versatile lexicons concerning terrain, nature, weather conditions and reindeer management. As well as in Sweden and Norway, in the reindeer herding terminology, we can perceive the abundant effect of the Sámi language. The different periods in the reindeer-herding year are seen in Sámi language as definitions of several months. May is *miessemánnu*, the month of calves, because the calves are born in early May on the first snow-free places on the mountains. August, *borgemánnu*, has got its name from the reindeers' new hair. October is *golggotmánnu*, in other words the rutting season of male reindeer. These names may have varied according to the area and there have been 13 of them earlier. In addition to the Sámi language, there is, in turn, the effect of the Komi and Nenets languages, also visible in reindeer herding terminology on the Kola Peninsula. In Russia, the reindeer herding terminology is extremely stratified and interesting because e.g. the árkan, which means lasso in Russian language is an old Turkish loan in Russian. The Nenets' similar word would be *tínchyah, tynzja*, which has been borrowed by the dialects of Russian as a synonym for *tynzėj*.¹⁵

As one can forecast, there will be thousands of exact terms and descriptive epithets for snow, ice and similar natural phenomena in the Sámi languages and northern dialects. Israel Ruong classifies them as follows: 1) amounts of snow; 2) the composition of snow; 3) the bearing capacity of snow; 4) the surface, level and slide quality of snow; 5) expressions for being covered with snow; 6) untouched snow and tracks in the snow; 7) hoarfrost, frost and other coverings of ice and snow on plants and trees; 8) the melting and disappearance of snow; 9) ice; 10) the appearance of (patches of) unfrozen land; 11) places where the snow remains in the summer; 12) different kinds of winter pasture, incl. expressions for the surface quality of the snow (Kjellström 2000: 65; see also Eira 1994: 54–77; Jernsletten 1994: 234–253).

The reindeers' eating and moving possibilities depend on the properties, amount and quality of snow. It has been possible to use either a

¹⁵ I want to express my gratitude to PhD Tapani Salminen, University of Helsinki, for this information.

human being, a ski stick or a reindeer as a measure when speaking about the amount of snow. For example, there is snow all the way to the knee or along the reindeer's stomach (Itkonen 1984: 478; Ryd 2001: 38–41).¹⁶ Due to the character of reindeer management, the reindeer herder must be able to separate the different weather conditions. He must know how to indicate also the quality of the snowfall, is it *räntä*, *pyry*, *raesade*, *maatuisku*, *lumikuuro*, *myräkkä* or what kind of snowstorm or blizzard and does the snow cover the trees or not? Does the wind transport snow, where the drifts are formed? The importance of snow knowledge was more important when people were still using skis and reindeer. Nowadays, it is enough to know where to drive with a snowmobile so as not to fall in the water during early winter.

During my fieldwork, I even asked the reindeer herders of Kyrö which terms of snow they did know. Some of them could remember only 10, some of them even fewer different words describing the quality or condition of snow. Some of them belong to the standard language – *hanki*, *kinos*, *nietos*, *sohjo*, *tykky* and *umpinen* – some of them were special terms as *sevä*. It means a layer of frozen snow on the ground below the snow layers, acting as an ice sheet. This snow formation causes poor grazing conditions (see more Ruotsala 2002: 339–340). My example shows, as Yngve Ryd (2001: 9), who has published a book containing snow terminology of a reindeer herder Johan Rassa from Jokkmok points out, that this kind of work will require as many as several hundreds of discussions with the same informant during a work period lasting many years.

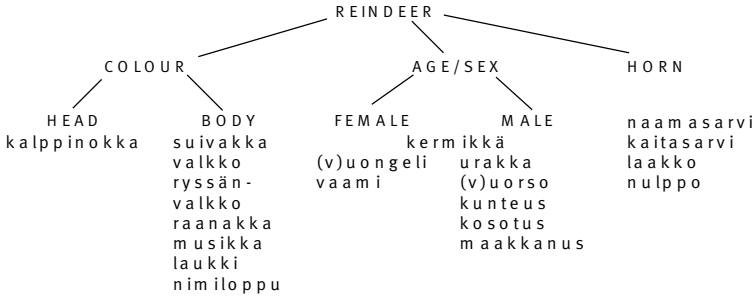
In spite of development of the technology, in spite of new tools and other changes in reindeer management the effect of snow is still large; it is both an advantage and a threat. *Sevä*, *takkala*, *nuoska* and *hanki* tell about the properties of snow which are vital to the reindeer management; how the reindeer can dig its food from under the snow and how the reindeer herder can move in the reindeer forest. It is extremely important what kind of a bottom will be under the snow cover; will snow fall on unfrozen ground: “The bad bottom is when the snow came and the ground was wet. Then everything froze over, ice layers were formed. It was very difficult then.”¹⁷

¹⁶ TYKL tutkimusarkisto 1.6.27/13.

¹⁷ TYKL tutkimusarkisto 1.6.27/15.

The reindeer herder still knows the exact definitions of the individuals of his herd according to the sex, age, the quality or position of the horns, the color or quality of the hair/fur, the form of the body, according to the properties of the character or according to another specialty. The names vary in the different parts of the reindeer herding area. In the following figure, I have listed examples of definitions which in accordance to the form of the reindeer's age, sex, color and horns and are known in Kyrö Reindeer Owners' Association.

Figure 1. Examples of the definitions concerning the reindeer according to color, age, sex and appearance.



Finally

Language changes all the time and the reindeer herding language will also adapt to the changes in reindeer herding and its conditions. The continuity of reindeer management and reindeer forest means different things to different groups. For the reindeer herding families and also for a part of the local population, the continuity means that the livelihood will also be obtained in the future from natural resources. From the point of view of environmental authorities and scientists, the continuity means the continuity of biodiversity, the conserving of natural diversity. The third view on the continuity is seen in the tourists' desire to keep Lapland "unchanged", conserving or preserving without new technology and development.

The significance of the traditional environmental knowledge was important especially when herders were still using reindeer, skis or were walking in the reindeer forest. When the motor vehicles, such as snowmobiles, motorcycles and even airplanes and the helicopters have become

common in the reindeer herding work, the significance of the environmental knowledge has diminished but the significance of the technical know-how has in turn been emphasized. If a snowmobile breaks down in the terrain, you must be able to know how to repair it or leave the wilderness without any help. Terminology, which is related to nature is becoming poorer, but language which is related to the technique will get rich when the livelihood changes. Today's reindeer herder cannot perhaps explain the quality of snow with as many terms as his father, but instead he knows the machine and EU terminology. The reindeer herders, who were born between the 1950s–1970s, are able to discuss fluently the Acts on Reindeer Husbandry, the different measures of support and directives of the EU which affect the reindeer management. The know-how of this vocabulary is important because the reindeer herder must know how to speak the same language as the rest of society. Likewise the reindeers' feeding in fences and distress feeding which has increased has changed the contents of the information in their part. More and more measures of support from the government or state are directed to reindeer management and in turn it exposes reindeer management to an increasingly tight control. However, it is not enough, that the reindeer herders knows the desk top reindeer herding and its terminology, because he still experiences that he is getting his living from the reindeer forest, not from Brussels. Without the knowledge of nature and without traditional environment knowledge, reindeer management cannot be practiced without the character of the reindeer management changing totally.

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