VARIATION IN TIME ALLOCATION AMONG REINDEER HERDERS IN WEST FINNMARK, NORWAY

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Summary

Reindeer (*Rangifer tarandus tarandus*) husbandry is believed to be the cornerstone of the Saami culture in northern Fennoscandia. The proposed project will focus on variations in time allocation among Saami reindeer herders in West Finnmark, Norway. This project will explore how herders deal with decision trade-offs in connection to time use. These trade-offs will most likely result in different herding strategies adopted by different herders, and such differences are believed to be an important factor in explaining geographic variation in the number of reindeer in Finnmark. Moreover, variations in reindeer numbers between different pasture areas, and between different husbandry units may also be explained by such decision trade-offs. This study will focus on the West Finnmark Reindeer Pasture Area because Saami herders in this area make more additional earnings compared to other areas in Norway, and because this area has great variations in reindeer numbers. The approach outlined in the present study can, within the time limit for the project, generate knowledge concerning time allocation and the within as well as across herd variation in productivity. This again can be used for developing sustainable management plans that are both grounded in a local setting, working with local practises and that are based on sound scientific considerations concerning resource use.

Objectives

Main objective

- To obtain a comprehensive and detailed description of how reindeer herders in West Finnmark allocate time, and to achieve a better understanding of the relationship between time use and productivity in the reindeer husbandry.

Sub-objectives

- To quantify how a varying herd size and within-herd-productivity is affected by time allocation.
- To examine variations in how reindeer herders obtain information concerning the spatio-temporal variation in vegetation quantity and quality on a day-to-day basis.
- To examine variation in "currencies" within the reindeer husbandry.
- To quantify how time allocation co-vary with a spatio-temporal variation in quality and availability of pastures.
- To quantify how time allocation co-vary with predator pressure.

General Background: The Pastoral System

Nomadic pastoralism can be defined as the dependence on livestock, i.e. use and care of animals such as e.g. sheep, goats and reindeer, in combination with spatial movements or mobility (Bates & Skogseid 1997). According to Seymour-Smith (1986) the word 'nomad' is derived from the Greek word *nemo*, which roughly means, "to pasture". Although the word 'nomad' refers both to mobility and to a pastoral base of subsistence, it is possible to distinguish between nomadism (Humphrey & Sneath 1999 and Salzman & Galaty 1990 provide a discussion of the term 'nomadism') as referring to mobility, and pastoralism as a mode of subsistence (Khazanov 1984). Dyson-Hudson (1980) similarly defines nomadic pastoralism as a social form characterised by the combination of dependence on livestock and spatial mobility. Pastoralism falls into the category of food-producing economies, since they rely on domesticated animals that are controlled by the pastoralist (Paine 1994; Khazanov 1994). What constitutes a nomadic pastoral adaptation in one society, however, cannot be described and compared with a basic "ideal type", but has to be investigated empirically in order to be properly understood (Spooner 1973).

The Reindeer Husbandry in Finnmark

Saami reindeer pastoralism in its present form is believed to be the cornerstone of the Saami culture in northern Fennoscandia (Bostedt 2001), and it is historically relatively recent, only 3-400 years old (Paine 1994; see e.g. Bostedt 2001 for different estimates). It probably evolved from a hunting culture that was based on wild reindeer. By the Middle Ages most Saami groups probably both hunted wild reindeer and kept "tame" animals, and within the last three hundred years reindeer pastoralism has become a specialized practise for several Saami groups (Paine 1994). Over the years, this form of pastoralism has undergone changes, the most important probably being the change from milk and meat production with smaller herds to meat production alone with larger herds (Paine 1994).

Traditionally, reindeer pastoralism was based on families, or households, that followed their herds' year-around, and the pastoral economy was primarily tied to reindeer and reindeer products (Vorren 1978). Central to the reindeer husbandry was the *Siida* system, a co-operative unit composed of one or more reindeer management families, usually organised on the basis of kinship, which joined in a social and labour community for keeping control over a herd of reindeer through herding (Pehrson 1964). A central concept in reindeer husbandry is that of *herd management*. Paine (1964; 1971; 1972; 1994) conceptualise herd management to embody two principles of interdependence, i.e. between *herd*, *personnel* and *pasture* (the principal factors of production) and between *herding* and *husbandry* (however, see Dyson-Hudson 1972:14 for a discussion on the analytically use of the terms). An important aspect in *viable* herd management is the possession of the three principal factors of production in commensurate proportions. Failure to reach commensurability results in difficulties for the pastoralist, e.g. herds without sufficient manpower available to herd them will probably suffer continuous depletion of the herd (Paine 1994). Paine (1964) defines herding as the relationship between herd/pasture in connection to the welfare of the animals in the terrain, which is the responsibility of the siida group (Nilsen & Mosli 1994). Husbandry on the other hand, relates to the reindeer herd as a resource of its owners (Paine 1964). Husbandry for Paine (1964:79) is "[…] the efforts of the owners in connection with the growth of capital and the formation of profit". Decisions in connection to husbandry are the responsibility of the household, or *Baiki* (see Nilsen & Mosli 1994).

However, during the 1960-1990 reindeer husbandry underwent major technological, economical and political changes (Riseth 2003). Of importance here is that the production system changed from being subsistence based to a motorised and market oriented industry (Riseth 2003). The changes has been summarised by Vorren (1962, in Riseth 2003) as follows: (1) more extensive management (decrease in contact between man and animals, see Beach, 2000 for a discussion concerning the erosion of herding skills), (2) the subsistence economy was replaced by a money based economy, (3) sedentarisation, (4) reindeer husbandry as an occupation and not as a way of life, and (5) an increase in the use of modern technology. Also, Bjørklund (1999) argues that while in traditional reindeer husbandry the principal factors of production were under the control by traditional institutions, during 1960-90 the Norwegian government assumed the control by e.g. setting a limit on the number of animals, and by controlling the recruitment of reindeer herders by the use of a quota system.

This study will be placed within the framework of Ecosystem Finnmark (Anonymous 2003), and will have as its starting point the geographical variation in reindeer numbers among the Saami reindeer districts in West Finnmark (see Anonymous 2003 for a presentation of the spatial-temporal variability in reindeer numbers). Following Barth (1994) this study will see how peoples' decisions regarding allocation of resources generate different social forms. The 'resource' in this study will be time, and how variation in herders' allocation of time is related to variations in herd management and productivity.

Time Allocation

This study will make use of time allocation (TA) techniques, which integrates the use of quantitative and qualitative methods. TA techniques have been used to answer a number of different research questions in ecological- and economical anthropology (Johnson 1990; see Carlstein 1982 for a review). For example, Gross et al. (1979) used TA to study changes in labour inputs following greater market involvement among tropical horticulturalists. Rappaport (1971) used TA to study energy flow in human ecosystems, Dufour (1983) used TA to determine daily energy expenditure in a nutrition study, and

Sahlins (1972) used time data from several foraging groups to support his argument that hunter/gatherers use relatively little time to meet their necessary food requirements.

The use of quantitative methods allows hypotheses to be tested statistically and opens up for cross-cultural comparisons on a statistically basis (Mulder & Caro 1985). The use of TA can provide the basis for describing and analysing intra-cultural variation, seasonal, ecological, and other forms of variations (Gross 1984). For simplicity TA uses the western time units as the base for the study of behaviour (see Zeitlin 1990 for the use of emic categories in the study of time use). TA studies provide a framework for a detailed analysis of individual variation and a comparison of the performance of social units such as households, villages etc. (Gross 1984). In other words a TA study provides a framework for studying variations in time use in herding practises.

Herding strategies

An indirect correlation between number of animals and time spent herding is indicated by the assumed positive relationship between labour availability and the optimal use and care of animals (Paine 1994; Bollig & Göbel 1997; Göbel 1997; White 1997). For example, there is a positive correlation between the number of adults in a household and the number of livestock among nomadic pastoralists in Tibet (Næss, M.W., unpublished data). In summary, households with access to a larger workforce can spend more time in effective herding, and have, in general, more animals than households with a smaller workforce. This is connected to Chayanov's (1966) term 'dependency ratio', i.e. the ratio between dependants (i.e. children) and workers (i.e. adults). It has been found that households' dependency ratio correlates with factors such as wealth (Stier 1982), and that wealth can be connected to household size (Fratkin 1989). There is, however, considerably debate on to what extent labour availability influence herd management and herd dynamics (Sperling & Galaty 1990; Borgerhoff Mulder & Sellen 1994). Suggestion have been raised that labour limits (1) the number of sub herds that can be managed (Sieff 1997), (2) the numbers of animals within herds (Sieff 1997), and (3) herd growth (Dahl & Hjort 1976). Scoones (1992) argue that there is little evidence available to support the claim that labour availability influence herd dynamics on the household level. Evidence has been presented to show that there exists no positive correlation between labour and herd dynamics (i.e. mortality rates, reproductive rates, and hence production) among the Datoga pastoralists in East Africa as long as minimum labour requirements are met (Sieff 1997). This can to a large degree be explained by the fact that nomadic pastoralists exchange labour to circumvent labour shortages (Næss 2003), and form cooperative herding groups, or siidas as among Saami reindeer herders in Norway.

Nevertheless, it is important to get an understanding of how variation in decision trade-offs connected to herding influence productivity in West Finnmark, especially in the context of change. For example, Beach (1981) uses the term "the extensive spiral" to suggest that as less and less time is invested in reindeer herding, the wilder the reindeer become and the greater the loss in animals. A useful concept here is that of 'portfolio entrepreneurship', i.e. simultaneous ownership of two or more businesses (Westhead & Wright 1998). Portfolio entrepreneurship gives behavioural flexibility to actors living in unpredictable environments, since actors then can manage and direct resources towards markets that are more promising (Anonymous 2003). It is to be expected that reindeer herders participate to a varying degree in other economic activities beside reindeer herding. For example, some nomadic pastoralists in Tibet engage in e.g. trading to a larger extent than others (Næss, M.W., unpublished data). This can have consequences for reindeer herding, since herders may have to make decisions that will result in a trade-off between time invested in the care and well being of their animals and other non-husbandry activities. Also, Paine (1994) indicates that there are variations in when Saami herders monitor their herds'. While some Saami herders stay close to the animals during calving, others claim that animals should be left alone before and after calving, since females need to be undisturbed during this time (Paine 1994). Consequently, there are variations in decisions regarding when to stay close to the herds and when not to, and this can have effect on reproductivity and mortality.

Dealing with Vegetation Variability

Mobility, or rather a decrease in mobility, is considered to be a factor that has contributed to grassland degradation. A decrease in mobility often leads to more intensive grazing and an increase chance of

imbalance between animals and vegetation on a local level (Humphrey & Sneath 1999; Scoones 1994). Consequently, mobility is important to conserve vegetation productivity in areas with low precipitation (Behnke et al. 1993; Ellis & Swift 1988; Westoby et al. 1989).

Mobility has been described as a rational response to seasonal variations in the environment (e.g. Evans-Pritchard 1940; Stenning 1957; 1959 & Dyson-Hudson 1966; 1972). This is fairly obvious when considering large-scale phenomena such as snow, drought or large seasonal variations in location of grazing areas. Consequently, patterns of movements are easy to find on a relatively large scale. However, patterns of movements on the level of individual herders are more difficult, if not impossible, to find.

Reindeer has been described as an opportunistic animal that moves over large areas in search of optimal food (Warenberg 1982). Reindeer have to deal with vegetation of variable quality, e.g. nutritional content decreases with increasing maturity (Van Soest 1994), and in general the quality decreases during summer (Warenberg et al. 1997). At the same time, the density and quality of the vegetation vary, and there are indicators suggesting that animals can discriminate between good and poor grass, e.g. more animals graze when the access to protein rich vegetation is high (McNaughton 1990).

Important here is to asses how *reindeer herders* deal/relate to vegetation of varying quality. For example, optimal foraging models used to describe the optimal exploitation of a resource are based on intake maximisation and prescribe the optimal duration of foraging in a patch (field) (De Boer & Prins 1989). However, De Boer & Prins (1989) found that movement strategies among herdsmen in Burkina Faso are optimal in a longer time frame than when considering movements between individual patches, i.e. the time frame of decisions to be taken by the herdsmen encompasses at least the time between departure from the home base and subsequent return to it. However, decisions regarding movements must also include social and political factors (Woodburn 1972; Gulliver 1975). For example, Saami reindeer herders also have to deal with how to move in relation to other herders, or siidas, since this can create potential conflicts over resource use and also unwanted mixing of herds (see Sara 2001 & Bjørklund 1999). Also, movement from winter to summer pastures is regulated by the Norwegian Government regardless of wishes of the herders. As such, reindeer herders have to deal with trade-offs between movement regarding the best vegetation, other herders in their environment, and political decisions. A central concern then is whether there is any variation in individual herders' knowledge about their physical and social environment. As in all pastoralism, the acquisition of information regarding the state of the world in which they live is of utmost importance, and decisions based on good or bad information could be the base for success or failure in the herding game. As such variations in time spent gathering information, for example by talking and discussing with other herders, can play a part in explaining herders' success or failure as measured in number of reindeers.

Optimal Reindeer Herding

Nomadic pastoralists' dependence and relationship to their herds of animals have been described differently in the literature. From the "East African cattle complex", where the prestigious aspect of having large herds was given weight (Herskovits 1926), to Barth's (1961 & 1973) theory that nomadic pastoralists maximise livestock numbers in conditions of communally owned pastures, nomadic pastoralists are risk avoiders (Galaty & Johnson 1990), nomadic pastoralists seeks reliable food intake (Roe et al. 1998), value short term off-take and value long term household survival (Mace 1993).

As for the Saami reindeer herders, it will be of importance to get an understanding of what exactly they consider as important, or optimise, since this will probably influence herding practices. Put in the framework of optimality (See Smith 1983 for a critical assessment of the use of optimality models in anthropology), we have to understand what currency[1] the reindeer herders try to optimise. For example, Riseth (2003) describes variations in production strategies between West Finnmark and North- and South-Trøndelag. While the focus in the areas is similar, i.e. meat production, the strategies they use are different, partially depended on resource distribution and social history (Riseth 2003).

[1] Optimisation analysis usually consists of specifying a currency (e.g. energy or number of animals), a goal (e.g. meat production), a set of constraints (factors that limits possible options), and a set of options (choices left open for the actors) (Smith 1983).

While West Finnmark herders optimise meat output through increasing herd size, herders in North- and South-Trøndelag optimise meat production through increased output per animal. Also, Mace (1993) found that the Gabbara pastoralists in Africa show flexibility in herd management to accommodate long-term household survival through the control of breeding rates of sheep. While models maximising short-term off-take of herds predict that breeding rates should never be slowed, Mace (1993) findings show that wealthy herders control breeding by restricting ewes' access to males, and thereby increase the longevity of females but reduce the number of offspring per year. The control of breeding rates is also explained by the cost of reproduction, especially in connection with droughts where the survival rate of pregnant and/or lactating females is relatively low. However, poor households do not engage in this practise, since they have no choice but to increase the number of animals. In other words, "Herders essentially face a trade-off between rapid reproduction but low female survival or slower reproduction but greater female longevity." (Mace 1993:330).

It has been observed that female reindeer have considerable costs in connection to calving (Fauchald et al. 2004; Tveraa et al 2003). For example, female reindeer with calves gain on average less weight during summer than females without (Fauchald et al. 2004), a factor that most likely will affect survival rates of female reindeer during harsh winters. A prediction from the model described above is that Saami reindeer herders most likely should slaughter more calves during winter with relatively much snow, if long-term household survival is the currency. However, this seems not to be the case, witnessed by Fauchald et al. (2004) who suggests that such a strategy should be encouraged as a management strategy since that in the long run this will result in larger animals, better pastures and consequently an increase in the reindeer's tolerance of harsh weather. However, variation in currencies also has consequences for herd composition. For example, Tibetan nomads had traditionally herds with more sheep than goats due to a focus on milk and meat production for subsistence. Recently, with the integration into a market economy and an increase in demand for both sheep wool and cashmere wool, the ratio of sheep and goats have changed from 3:2 in 1981 to 1:1 at present (Goldstein & Beall 1990; Næss et al. 2004). This has also influenced the sex ratio of herds, male goats and sheep give more and better quality wool and consequently Tibetan nomads keep more male goats and sheep than they traditionally did. Some of the same processes can also be found in the Saami reindeer husbandry. Traditionally herds of reindeer consisted of both male and female animals from all age groups, but when the Norwegian government assumed control over the principal factors of production, the herd structure of herds changed with a decrease in number of grown male animals (Bjørklund 1999).

Study Area

Today reindeer husbandry is practised in an area of around 140,000 $km^{2,}$ around 40% of the total landmass in Norway, and separated into 6 "Reindeer Pasture Areas (see Jernsletten & Klokov 2002). These areas are again divided into 90 "Reindeer Pasture Districts", with around 582 Saami husbandry units consisting of 2,794 persons with 190,827 reindeer (ibid; see also Ims & Kosmo 2001; Anonymous 2004 for a presentation of the organisation of pasture areas and districts). My study will focus on the West Finnmark "Reindeer Pasture Area" because:

(1) There is considerable variation in reproductivity and mortality within each reindeer pasture districts. For example, in 2002/03, the average number of reindeer per district was 3,164.8, ranging from 183 to 8,311 reindeer (standard deviation, SD = 2,586.9, the number of districts included are 25 for all calculations). On average 30% of all born calves in the same period were lost, ranging from 12% to 57% (SD = 9.8). The total loss of reindeer was on average 22.6% of total herd size per district, ranging from 15% to 46% (SD = 6.6) (based on Anonymous 2004). This loss is primarily attributed to predation (91% of calf loss, and 73% of adult loss) (Anonymous 2004).

(2) West Finnmark is one of the areas where Saami herders have more additional earnings as compared to other areas in Norway. While meat production makes up >50% of total income for herders in West Finnmark, additional income (handicraft, fishing etc.), nearly absent in all other reindeer husbandry areas, make ca. 12% of total income (Anonymous 2004).

Consequently, West Finnmark is an interesting area for studying reindeer husbandry decision trade-offs regarding time use.

Study design and Analysis

Broadly speaking, the collection of TA data may be differentiated into two contrasting dimensions: (1) subject self-report and (2) direct observation (Johnson 1990). By using self report one dissolves most ethical issues, since informants are in the position to decide which behaviour to report. Also, this form of sampling is time saving for the researcher, although the major drawback is that in general there is little correspondence between self-reports and behaviours measured by outside observers (see e.g. Bernard et al. 1984). As for direct observation, there are primary two methods used: (1) focal sampling, i.e. the continuous monitoring of individuals for a certain period of time, and (2) spot sampling, i.e. the recording of the behaviour of individuals at random times throughout the research period (Bernard & Killworth 1993; Mulder & Caro 1985). The representativeness of data from focal sampling is highly dubious, since it is extremely time consuming and researchers can, as a general rule, only collect data from a selected few individuals (Johnson 1990). A solution is to sample behaviour over time by making periodic spot checks of the behaviour of many individuals. This technique uses random patterns of visits to observe what members of the study population are doing at a given moment (Johnson 1990). Observations are randomised on the basis of both person and time, and hundreds or thousands of brief observations generates a representative sample. A statistically robust picture of patterns of time then emerges; based on the assumption that the percentage of times people are observed engaging in an activity is the percentage of time they actually spend doing it (Bernard & Killworth 1993; Johnson 1975; Gross 1984). This technique is, generally speaking, reliable and requires relatively little field time, leaving the field worker free to pursue other goals of participant observation (Johnson 1990). The main problem with this technique is that that observer effects on behaviour are bound to occur. However, this problem can be dealt with by interviewing and participant observation (Johnson 1990).

This proposed study will follow Ecosystem Finnmark's study design, which take strategically use of the large spatial variation in environmental gradients and grazing regimes provided naturally by the landscape and current reindeer herding practices in Finnmark (Anonymous 2003). This study will select two pastures/siidas with relatively low and high grazing intensity/reindeer numbers. This variation in reindeer numbers/grazing intensity does exist independent of the climate gradient (Anonymous 2003), which makes it possible to investigate the possible effect of TA with respect to reindeer herd productivity. This study will use participant observation combined with spot observation based on a randomised number of people from two districts to obtain qualitative and quantitative information related to time use.

To ensure a representative sample the strategy used in this study will be that of nested sampling (Pelto et al. 1989), where at the start of the fieldwork period a full census off all herders in the two grazing districts selected will be undertaken. This will serve two purposes, firstly to get an overview of significant behaviours, and how they should be coded. The issue of coding needs some elaboration. Cognitive categories differ between cultures, e.g. while all languages have words for units of time, either explicitily or implicitily, e.g. days, months, season and years (Brown 1991), not all cultures conceptualise time in the same way (Zeitlin 1990). Probably the most famous example of cultural variation in time concepts is Benjamin Lee Whorfs findings that the Hopi Indians either had no sense of time or that their sense of time was very different from the western concepts (Brown 1990). While this view has been refuted (see Malotki 1983) it is important in any TA study to design a study that can give room to explore culturally different cognitive categories. In TA studies this problem is dealt with in the process of *coding* behaviours. While cognitive categories, like e.g. what is considered to be work, differ between cultures (see Croll & Parkin 1992), it is possible to define behaviour in such a way as to both satisfy the need to preserve cultural uniqueness and the need to make generalisations that can be used cross culturally (Mulder & Caro 1985). Following Mulder & Caro (1985) this study intends to code behaviour with the use of both *physical description*, i.e. a description of the physical aspects of the activity, and *description by consequence*, i.e. an interpretation as to what the activity signifies for the informants and what the outcome of the activity is (see Mulder & Caro 1985 for a discussion).

Secondly, a full census is needed because the accurate number of herders that this study will be based on is impossible to estimate before a further knowledge of the distribution of herders and herds is obtained. Also, this period will be used to inform Saami herders about the purpose of the project and to find herders that are willing to participate. Later on a smaller random sample will be selected from this census for the purpose of an intensive TA study.

Since this study will focus on variation in TA it is important to design a study that can obtain information regarding seasonal variations in time use, e.g. variations concerning intensive vs. extensive herding (see e.g. Paine 1972) (e.g. during moving, slaughtering, calving, and marking of calves; see Sara, 2001 for detail). Consequently, this project will combine participant observation with intensive TA research in the course of one year. However, to get data concerning how variations in herd-productivity is affected by TA, and how TA co-varies with predator pressure it is necessary to do short, intensive TA studies (e.g. 1-2 weeks every season) the following year, since predator pressures and climatic factors such as snow varies from year to year, which again influences herd productivity. With this approach, data pertaining to variations in time use over time and under varying climatic conditions will also be obtained. These relationships will be analysed by the use of general linear models (see Neter & Wasserman 1974).

As for the question regarding currency, a method combining participant observation and informal interview techniques will be used. Variation in currencies can be related to variations in values, e.g. cultural, traditional, economical etc., that different herders place upon reindeer husbandry. By using a system approach (see Beach 1981; Fratkin et al. 1994; Næss 2003) it is possible to analyse how processes on different levels of decision-making constitute the reindeer husbandry. The starting point in this analysis will be a generative approach, which starts out by analysing how people make choices within a set of constraints and possibilities (see Barth 1961; 1966), e.g. processes that structure the herders' use of their animals. By using a systems approach it will be possible to analyse socio-cultural processes on different levels, e.g. how reindeer herders interact with other reindeer herders, for example through the siida system, and again how interaction with governmental agencies such as the Reindeer Husbandry Management Department structures different husbandry decisions. This again can partially explain variations in herding practises and time use. The questions regarding how reindeer herders obtain information concerning the spatio-temporal variation in vegetation quantity and quality and how TA co-varies with variations in quality and availability of pastures will be obtained and analysed with the use satellite vegetation maps and the use of geographic information systems (see e.g. Turner et al. 2001).

The knowledge generated in this study can be included in developing sustainable management plans, that are both grounded in a local setting, working with local practises and that are based on sound scientific considerations concerning resource use (see e.g. Chatty 2001 & McCabe et al. 1992 for discussion related to the importance of integrating local knowledge in management plans).

While I intend to take a Saami language course, I will to a large extent be dependent on translations of Saami terminology. This present a number of different problems, but I have found that it is possible to collect a substantial amount of both quantitatively and qualitatively information of reasonable quality with the use of translators (see Næss 2003 13:14 for a discussion).

Organisation

The aim and scope of the study is multidisciplinary and will be supervised by Associate Prof. Bjørn Bjerkli from the Department of Social Anthropology at the University of Tromsø (UIT) in relation to general social anthropological theory and Saami reindeer husbandry. Prof. Rolf A. Ims from the NRC funded project "Ecosystem Finnmark" and Department of Biology (UIT) will be a supervisor in the use of statistical methods, which will play a major part in this project. Finally, Dr. David Anderson from "Centre for Sámi Studies" (UIT)/University of Aberdeen will co-supervise the project based on his experience from reindeer herders in Siberia, Russia. This project is based collaboration between scientists - biologists and anthropologists - all of them having experiences from their own disciplines (see above), which I believe enhances the practicability of the study.

Publication Plan

The results from this study are of importance for the understanding of socio-economic factors that affect productivity within the reindeer husbandry. I plan to write three articles (in addition to the dissertation) that will be submitted to peer-reviewed scientific journals, this to ensure that the study keeps a high standard. One article will deal with the use of TA techniques in the study of nomadic pastoralists, and the two others will specifically deal with the empirical results of the study.

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