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Development of Property Regimes and Institutional Structure for Sustainibility in the Saami Reindeer Industry in Norway. A Comparative Study.

Abstract:

During the last decades the Saami reindeer production system has gone trough a transition from a mainly substistence based pastoralism towards a market integrated industry. The development has been clearly different in the central North Saami reindeer districts in Finnmark compared to South Saami districts in Troendelag. The former seems to be in a rather severe ecologic, economic and social crisis due to overgrazing while the latter seem to be rather well adapted to pasture resources and get well off economically.

The paper outlines the main differences in development in the two regions and discusses a set of explanations. We are mainly focusing on the following dimensions:

- internal factors: ecology , culture and institutions
- exogenous pressure: market integration, general social processes and public policy

Generally the traditional common property system seems to be to unsuited to handle the new situation . In the North we observe rising conflicts and undermined old common instituions while in the South instituional innovation have made it possible to cope with new challenges.

Three relations seem to be of special significance when explaining the different development paths. Firstly, differences in size and openness seem to have equipped the two societies with unequal capabilities to handle the transition in mode of production. Secondly, the transition has developed at a different pace in the two areas. Thirdly public policy did not sufficently take into consideration the different situation in the two regions.

In the North, as a result of the national integration of the local Saami society a set of exogenous forces seem to have put the established norms and rules under pressure. Processes like becoming sedentary, marketintegration and mechanisation challenged existing norms as they also increased costs. While productivity stayed rather unchanged, the overall result was a need for enlargening the number of reindeer. Public subsidies seem to have accelerated a spiral of investment in reindeer.

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Introduction

The Saami reindeer industry in Norway is small, extensive and marginal for the national state. But it is a major industry for the indigenous Saami people. It is further based on vulnerable renewable common-pool resources (CPR).

According to official statistics it consists of about 3000 persons and 200.000 reindeer (Reindriftsadministrasjonen 1993) with usufruct rights over about 40 % of the Norwegian land surface. Today it is the only specific Saami industry and plays an important role for sustaining Saami culture and identity. It is based upon the food chain pasture - reindeer - man.

The Saami people has lived of the reindeer from prehistoric times, but the mode of production has changed from hunting via subsistence pastoralism to a mechanized and market oriented industry. The land use pattern is mainly a reflection of the animals need for different season pastures. The land is a vulnerable resource, especially the lichenrich fall and winter pastures. The pasture is also threatened by encroachment and other forms of external pressure.

The transition from a mainly subsistence based pastoralism towards a market integrated industry has mostly taken place in the period 1960-1990. There is, however, considerable variation in the different parts of the Saami area i Norway both as the economical, ecological and cultural situation concerns. As Table 1 indicates, there are outstanding differences between central North Saami reindeer regions in Finnmark and South Saami districts in Troendelag. See figure 1 for map.

Table 1. Meat production[1)] and income[2)]. Average 1991-93[3)]. Regionalized.

	West-Finnmark	North-Troendelag	South-Troendelag/Hedmark
Meat production	**7,5**	**16,9**	**17,0**
Gross income	58	196	260
Costs	50	105	166
Net product	8	**91**	**94**
Subsidies[4)]	24	96	66
Net income	**32**	**187**	**160**

1) Kg in average
2) 1000 kr per standard man year
3) Basis year 1993
4) Subsidies includes action against radioactive contamination. Parts of this is compensation for income loss.

Source: Økonomisk utvalg 1992, 1993 and 1994.

Table 1 reveals that the two South Saami regions North-Troendelag and South-Troendelag/Hedmark have more than twice the productivity of West-Finnmark. This creates a great difference in net income.

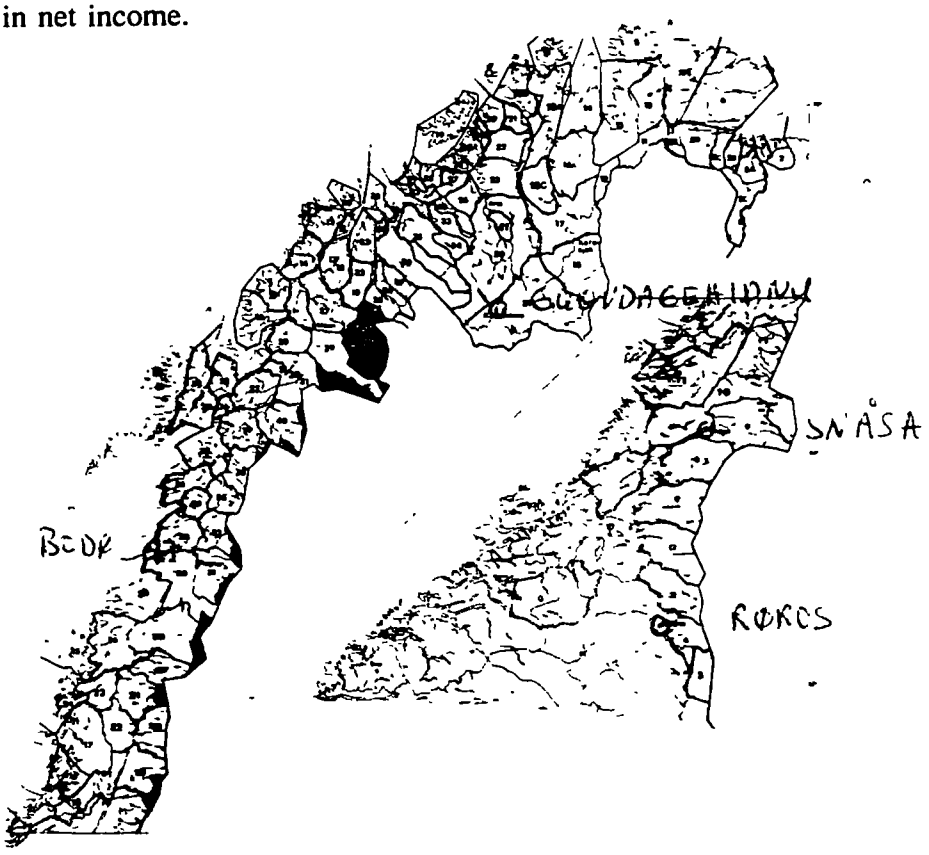

Figure 1. Map over Saami reindeer pasture districts

The general impression is that in the central North Saami areas the reindeer industry seems to be in a crisis due to resource degradation/overgrazing. A series of pasture surveys (Aarak & al 1981, Orvik & Prestbakmo 1990, Tømmervik & Johansen 1990, Moxness & al.1993) substantiates a severe overgrazing of the lichenrich winter and autumn pastures in the inland of Finnmark. The situation indicates need for a considerable reduction in the number of reindeer for a longer period.

In the period 1976-1986 the number of animals doubled. The slaughter weights were considerably reduced and there are also indications that the total yield passed its maximum in the early 1980s (Riseth 1988). There are further reports (Prestbakmo 1984) indicating that established social norms of pasture use has disintegrated while internal competition has become harder.

Contrasting this, the South Saami area seems to be rather well adapted to pasture resources and get well off economically. The number of reindeer is stable and the total production is increased due to a more efficient pasture use made possible by restructuring the herds.

Our aim here is to describe the differences and discuss a set of potential explanations. Using a comparative approach, we will be able to focus both on those processes that the two regions have in common and those distinguishing them. We will try to focus on both internal factors and exogenous pressure.

It seems rather obvious that the problems with overgrazing/resource depletion in the North is the result of a badly functioning common property regime. But one may ask whether we are observing a simple disintegration of a previously well functioning system or whether the problem is lack of capasity to transform as the transition from subsistence to a market orientation has taken place. If so, the problem is to explain why the system was not able to adapt in the North. Comparing with the South, transformation and adaption prosesses may be rather successful.

Studying the Saami society, one realizes the importance of its subordination under the policy of the Nordic national states. We will thus try to focus both on internal processes generated by the dynamics of reindeer herding and existing Saami institutions as well as the influences made by the Norwegian state authorities.

2. Institutional Dynamics

2.1 Saami reindeer management as a mix of individual and common property

Common property regimes may arise for several reasons. The productivity of the resource may be of great importance for the choice of regime (Bromley 1991). Some resources like the reindeer pastures have low productivity and the cost of dividing the land into individual parcels and the enforcement of these rights more than outweighs the potential gains from division and the control with resource use thus established.

In such a situation there are two options. Either to try to set up some sort of a common property regime or to let resource use remain unregulated - i.e. open access. The potential consequences of open access are well known. Due to the established incentive structure, resource degradation is the most probable outcome.

In the areas of our study the reindeer based production system has been pastoral for a relatively long period. According to Paine (1994) a prerequisite for viable herd management is the posession of three assets in commensurate proportions: herd, partners and pasture.

In the Saami reindeer management animals have been individual property while herding and pasture have been communal. In this society there are further two traditional basic units; the **household** and the **siida**. The animals belong to the household while the the siida is the group of households which is managing their animals in a common herd. The siida may vary in size according to different needs in different seasons.

The pasture is mostly utilized by several siidas. As far as there exists a common property regime, it will thus exist as an agreement between a group of siidas. The relationships in

the household and the siida can be visualized in the following triangles:

Figure 2. A. Herd management of commensurate proprortions (Paine 1994)

B. Individial and and collective characteristics of the siida. (Riseth 1992)

2.2 Common property regimes

Bromley (1991) defines a **resource management regime** as a structure of rights and duties characterizing the relationship of individuals to eachother with respect to that particular resource. He notes that the allegory "tragedy of the commons" arising from Hardin (1968) has confused both scolars and others giving *common property* a misplaced responsibility for resource degradation that properly belongs to a sitauation of *open access.* For most purposes Bromley find it sufficient to consider four possible regimes:

- Private property regimes: Owners have right to socially acceptable use.
- State property regimes: Authority agencies have right to set rules of access and use. Users have duty to observe these rules.
- Common property regimes: Co-owners have right to exclude non-owners. Individual owners have rights and duty according to use and maintainance.
- Non property regimes: Everybodys property is nobodys property (open acces regimes)

Common property regimes are further characterized by:

* Private property for a group of co-owners
* Exclusion of non-owners
* Social units with definite membership and boundaries, common cultural norms and endogenous authority systems.

Bromley emphasize that compliance protected and reinforced by the authority system is a necessary condition for the viability of any property regime. Breakdown will cause common property to degenerate into open access caused by internal processes and/or external pressure.

He accentuates two kinds of problems that may arise in common property regimes (op.cit.):

* Breakdown in compliance by the co-owners caused by other economic opportunies.
* Low support to common property from the state , e.g. governmental support to private property encroachment on common property regimes.

Seeking to reveal the conditions for sustainability of common pool resources Elinor Ostrom (1990:90) has made an analysis of resource regimes which is self-organized and self-governed and have proven to be long-enduring. She suggests the following design principles for long-enduring CPR institutions:

1) Clearly defined boundaries both of the CPR itself and who have appropriation rights.
2) Congruence between appropriation and provivision rules and local conditions
3) Collective choice arrangement - participation of affected individuals in rule change
4) Monitoring - self monitoring or monitors that are accountable to the appropriators
5) Graduated sanctions - from appropriators/their officals to those who violates the rules
6) Conflict resolution mechanisms - with access to rapid low-cost local arenas
7) Rights to organize own institutions not challenged by external governmental authorities
8) Nested enterprises - multiple layer organization when part of larger systems.

Both creating, maintaining and adjusting such a resource use regime is demanding. The costs thereby seem heavily related to the number of actors within the communal group, the internal potential for conflict and the difficulties of defining the CPR boundaries. This also means that in a situation where the system is stressed - either from inside or outside - the magnitude and the speed of the change must be important.

2.3 Reindeer management dynamics

2.3.1 Pasture

When the resource is not fully utilized (number of animals is low in relation to pasture potential) the herders are mainly confronted with minor coordination problem. Herd expansion may take place. In a situation where pasture is a scarce resource, there is a possible conflict between the herders. Under pastoralism the mixed property rights in figure 2 illustrates that the individial household head has a dilemma; on the one hand the dependence of his siida partners and the long run effects on pasture resource and on the other hand the responsibilty for his own household.

The individual owner will be inclined to increase his herd as much he can if not restricted by inadequate pasture or workforce. Even if this leads to collective insecurity, the greater herd will give increased security for the individual than the small when overgrazing is a fact.

2.3.2 The herd

The herd is a self-multiplying resource, but the pastoralists are protecting the herd against predators and the competition from other herders. They also mediate the relationship herd-consumer by design of herd structure and realisation of yield. Analytically the reindeer work may be divided into herding and husbandry (Paine 1964 and 1970). **Herding** is the work with the common siida herd on seasonal pastures and on the spring and autumn migrations. **Husbandry** is the individual household work and the responibility of the household head called *isid* as its senior custodian. The management of the household herd as private property has its annual chronology with marking of calves, castration and slaughtering based upon accurate observation.

The herd management may be **intensive** or **extensive**. The notions are relative. Intensive herding means close and intense reindeer-herder contact and a high tamness grade. Extensive herding means less contact and more separation and a lower tameness grade (Beach 1981:34). Intensive herd management means good herd control and depends on a sufficient and skilled work force. With an inadequate workforce a process of extensivation may occur. In combination with more fences and use of mechanichal equipment extensive management may be a rational choice. But extensivation may also lead into a reinforcing process with negative resource use concequences (Riseth 1992). Extensive herd management may be close to wildlife management. In an area with high competition between the herders, the less controlled herds will tend to be reduced by intermingling and slaughter by others.

Historically the distinction between intensive and extensive follows a change from **milk based pastoralism**[3] towards a **meat based pastoralism.** The milk pastoralism was a small herd management performing summer milking. A small number of households were cooperating in a siida. With the transformation towards a more market oriented production, the meat became the only important resource favouring large scale pastoralism.

Ramstad (1967) found that tameness and control by relatively equal herds performing summer milking was effective factors restricting herd size to the limits set by pasture and the siidas own workforce. The transition to meat based production means not only greater herds, but also more housholds per siida and more uncontrolled summer grazing. Tameness due to milking disappears gradually. This means that herd expansion at the cost of the neighbours are more likely. Wilder herds increase the abilities of profiting on others pasture, workforce and animals. The production factors of other households enters the own households production function.

A more extensive control of the herd will drain off both pasture and animals and be inclined to lead to overgrazing and famine. The richest will tend to manage best. The herding will change character to watching the border against competing neighbours.

Successful herd management for reindeer pastoralists means herd growth. The herd capital is therefore the ultimate capital (Sara 1993). The top drain out of the reindeer society by conversion of animal capital[4] is very modest. Even though rich families may have more expensive consume habits and are inclined both to contribute more to the poor and more exposed to reindeer theft, this do not limit herd growth nothworthy.

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[3] Certainly milk pastoralism also included meat production. It was a combined way of resource utilization. The distinction made here relates to the fact that over time milk production disappeared.

[4] As known among the Basseri-nomads of South-Iran which is converting sheep capital exceeding 200 head to agricultural land (Barth 1961)

2.3.3 Partners and competers

The basic herder-herder relationship is partnership based on informal contracts. All herders have a web of potential partners based on kinship and relationships by marriage. Choice and change of partners seems to be a relatively pragmatic cost-benefit descision. That is, the web is stable while the partnership is of variable duration. The partner of this year maybe next years competer and the siida composition changes over time (Paine 1970, 1994).

The pattern of cooperation and competition is striking. Bjørklund (1990) points out two effects of this system:

- a permanent centrifugal dynamics; over time people are propelled into any area where grazing is available (other parts of Sapmi and even emigration)
- shedding of non-viable units causing settling down as sedentaries.

The tension between the individuals and the community as a whole is clear. The inherent expansion need is balanced by nature, competition and norms. Bromley (op. cit.) stresses the importance of the authority system and its social values and norms. But since these differ significantly between the two regions we are studying, they are best handeled as we analyses the North and the South separately.

3. Contrasting regional development

3.1. The North

The empiric material for the North is clearly richer than for the South. We thus starts here and make the presentation of the South more as a contrast.

3.1.1. Internal factors

Ecology

Especially the winter pastures both in West-Finnmark (Gouvdageaidnu) and most of East-Finnmark (Karasjok) are without natural borders and the realation to the neigbouring siidas become very important. The danger of intermingling with other herds is a challenge to cope with both autumn and winter[5]. In West-Finnmark these pastures are common pool resources for 274 management units[6] with 1415 persons adjoined (Reindriftsadministrasjonen 1993).

[5] A more accurate description of management and strategies in the commons of Finnmark is given by Sara & Kristiansen (1991)

[6] "Driftsenhet" according to The Act of Reindeer Herd Management

In Finnmark the summer districts on islands and peninsulas are well suited for extensive herding. There are also indications (Sara 1993) that summer milking have not been usual in Finnmark for over hundred years. That means that extensive summer herding is much older in North than in South. Pehrson (1964:4) also points to the difference between the extensive North Saami siida with normally 6-12 households and the more intensive South Saami siida with a few households.

Values and norms

The tendency of herd expansion commented on above is reflected in the value system. Paine (1971) emphasizes just herd expansion as a **basic pastoral value**[7], which "is often practised whether or not there is an opportunity for corresponding expansion of pastures... that overexploitation is most likely to occur." Possessive individualism (Paine 1994) and independence of others (Ingold 1980) are also important related values.

Finnmark winter siida pastures were mapped already in 1910 (Nissen 1985) and a 1933 study on Saami institutions underlined that the Saami reindeer pastoralists had clearly established **perceptions** of which pasture areas belonged to which siidas and that these perceptions passed on between generations (Solem 1970). Everybody had rights also to alternative pastures in crisis (Solem 1970:190, Paine 1994:83). The value of respecting others pasture seems to have been rather strong. Still the sanctioning has only been based on different forms of **social control**. We note that this norm system competes with the value of possessive individualism.

Authority system

The Saami pastoral siida is led by a *primus inter pares*; siida-ised. He is never elected but accepted as a natural leader and is usually a mature and succesfull owner with the largest herd and central place in the social web. The main descions of the siida-ised is herding descisions, but in case of conflict he has the right to decide membership in the siida (Vorren & Manker, 1976).

The Saami pastoral society is acephalous; there is no individual or assembly with authority above the siida. Thus there has been **no formalized** system of top level authority for the saamis themselves. The result is a society which as a whole has some anarchic features with dysfunctional implications (Paine 1970).

So the control of siida based decisions are of a social character only. Further norms and values seem to have a somewhat ambigious character, where the socially controlled pasture regulation competes with the ambitions of having a large herd that is sanctioned as a positive social value too. At household level inadequacy of workforce and pasture may

[7] Paine builds on fieldwork in Guovdageaidnu .

limit herd expansion to some extent. The regrouping mechanism of the siida system is shedding out households which are losers in the resource competition. But conflicts between siidas must be solved either by competition or what seems to be rather weakly sanctioned social norms.

3.1.2 External factors

Constitutional and legal incorporation

The lack of a top level authority of the saami society, has made it vulnerable to external social and political pressure. After a gradually and competing colonization from the Nordic nation states during more than a half yearthousand, the Saami areas were finally divided with national borders. One of these are the Norwegian-Swedish border from 1751. The rights and duties of the Saamis were treated in a special additional tractate called The Lapp[8] Codicill. The reindeer Saamis had to be citizens of one of the countries, but the traditional seasonal movements accross the border were allowed to continue. The Codicill was followed by Acts of Reindeer Management and Conventions of Reindeer pasture. While the intention of the Codicill was to take care of the need of the Saami pastoralists, the Acts and Conventions shrinked their rights in the interests of the states.

From about 1880 the Norwegian authorities conducted a minority policy which had full assimilation of the Saami People into the majority population as its aim. Consequently the intention of the legislation of reindeer management was arranged for agricultural exspansion. The Act of Reindeer Herd Management of 1933, which was in force until 1979, built on a view of pastoralism as *a dying way of life which might be allowed to exist until it vanished presupposing that it gave way in conflict with agriculture* (Kosmo 1991).

There are however strong indications that the authorities early in this century evaluated the reindeer herd management of the North more positive than of the South (Sørum 1984).

The first organized Saami ethnopolitical activity resulted in a congress for Saami from all Norway in 1917. The negative public policy towards the Saami still lasted up to the post Second World War time. In the 1950s a Pan Saami ethnopolitic movement grew in both Norway, Sweden and Finland. The Association of Norwegian Reindeer Herding Saamis (NRL) was founded in 1948. During the 1960's some changes in public policy came. Research and advisory services were established and a new Act of Reindeer Herd Management was under preparation.

A general outcome of the negative public policy seems to be a weakened basis for developing a stronger reindeer herd management system. This shrinked the internal incitaments to adjustment and positive development.

[8] Lapp is an old colonist word for Saami and is not in official use today

The modernisation process

The transition from subsistence to market oriented production - the socalled modernisation process - started about a hundred years ago and has been induced by several factors. Some of them have been initiated by Norwegian public policy while others are following more autonomous societal processes. The pattern of developement differs between regions.

The ethnographist Ørnulv Vorren (1962) gave an accurate description of the Finnmark pastoralism and its land use pattern in the late 1950's. He writes: "Reindeer herd pastoralism of Finnmark seem nowadays to be in a phase of development which is fully dissolving old forms" (our translation). He pointed at:

- dissolution of the family adherence to the herd as only men become herders ---the family become an equipment base, but less own production and more tradables. That is reduced productivity per household member
- extensivation of the herding (with more use of fences) and less control causes more intermingling and thereafter herd division on autumn pastures
- greater number of animals and poorer use of parts of the area , less additional income from hunt
- increased need for cash causes need for herd increases

His conclusion was: "The ancient traditional herd management and its whole economic pattern is crashing. We have to face the consequenses and create a new system adapted to modern economy and way of life" (Vorren 1964:11-12, our translation).

Going from this contemporary judgement to an ex ante analysis three subprocesses seem to have been of special importance:

* Family settlement for a sedentary life
  - from full nomadism (where the family follow the herd year around) to living in modern houses which the herders use as an equipment base. The family visits the herd occasionly.
* Mechanisation
  - from full dependence og human and animal muscle power to use of snowmobiles, motorcycles, cars and other vehicles.
* Market integration
  - from subsistence production and self supply of most daily needs with limited sale for cash to a meat production orientated industry which is buying both production inputs and most of daily life goods.

Both school and housing policy were promoting the families to settle. School reforms, which about 1960 increased the obligatory school year from a few weeks to most of the year and support for housebuilding, had important effects (Nilsen & Mosli 1994).

In the late 1960's the snowmobile appears as a potential means of welfare enhancing (Paine 1994). It was promoted by the sedentary settlement. The herders could now increase their time with the family considerably. In later phases the snowmobile and other vehicles increasing mobility contributed to change in herding techniques. Especially important is the fact that the pioneer using a new type of vehichle is deciding the level of mechanisation for adjacent herds because of the competiton advantage (Riseth 1987).

Traditionally the pastoralists in Guovdageaidnu had sold meat at a market by the seaside[9] where they sold to merchants. One of the first signs that the State began to look at reindeer management as an industry is the establishment of slaughterhouses in the middle of the 1950s. The traditional markets disappeared in the 1950s. A car road Alta - Gouvdageaidnu was finished just before the Second World War. Paine (1994) make comments upon pastoralists cultural dilemma of the 1960ies where pastoral possession confronted pastoral production.

Reviewing Paines commensurate proportions of herd, partners and pasture and the property relations of figure 2, we notice that the process of sedentarisation is changing the herd/workforce relationship (triangle corner 1) mainly on household level dividing woman and children from the herd. The technological innovations firstly cemented this and secondly changed the herding pasture relationship (triangle corner 2) by increasing mobilty and pasture exploitation. Thirdly and most important, a more extensive herding from the 1970's created potensial for increased competition between households (triangle corner 3) and even more between siidas.

The first snowmobiles were bought by conversion of animal capital. A characteristic of at least the early technology investments is that they were investments not primarily in increased production, but more in increased **welfare and competitional power**. Thus they should be understood in a household and management dynamics perspective. Nevertheless they increased costs relatively much and developed a deeper link to the outside markets which up to the 1970's had been clearly subordinate to the household economy. They introduced what Beach (1981) has called **the problem of the rising subsistence minimum**. Each household needs more animals to live from to fullfill its budget constraint. The full effect of this however, did not materialize before in the 1980's. Before discussing this further, we must take into consideration the institutional innovation of the late 1970's.

New Institutional arrangements

The Assosciation of Norwegian Reindeer Herding Saami (NRL) played an increasingly important role arguing for industrial development and legal protection of their way of living. In 1976 the government and NRL signed The Main Agreement for the Reindeer Industry. In 1979 the new Act of Reindeer Herd Management was finally approved by the Parliament. In 1980 The Agency of Reindeer Management (RA) and a new institutional structure were established. They constituted the foundation for a new and positive public sector policy.

The main traits of the new institutional arrangement were:

1. The Agreement was a basis for a organized state - industry cooperation. Subsidies to the industry when conditions fullfilled.
2. New political objectives:
   - optimized meat production with sustained natural resources

[9] Bossekop, Alta.

- secure income and living standard for the herders
- economic sustainable management units (households)
- basis for Saami culture and people living in marginal areas

3. New and strong central agency (RA) both administrative and professionally
4. New positions as agronomists of reindeer herd management established instead of the system with Lapp sheriffs
5. Democratic boards with strong herder representation both centrally and regionally.
6. Reorganising of the reindeer pasture district which got a double function:
   - representative of the local reindeer herder collective (partly replacing the siida) with elected chairman and board.)
   - control tasks for the state
7. Formal status for the household as management unit.

The new institutional arrangement covers both the micro and the macro part of the reindeer herd management. The Ministry of Agriculture (LD) is responsible on behalf of the state. The core of the governing system is thus the triangle showed in figure 3.

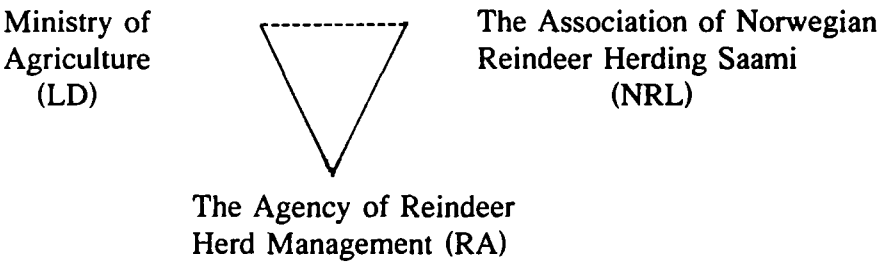

Figure 3. The institutional triangle of the reindeer industry (Riseth 1994).

The Ministry (LD) and the Association (NRL) are the formal parts of the Agreement while the Agency (RA) is the Ministrys adviser and executer of the result of the annual negotiations. The Act of Reindeer Herd Management is managed by LD and RA.

During the 1980s a pattern of extended cooperation was established[10]. Most important policy descions were in reality taken in common by the leading state officials and the herders elected leaders. Thus the reindeer herders during the 1980s managed to get considerable influence on public sector policy by means of their organisation NRL (Riseth 1992). In spite of this influence, as we have seen (table 1), the results of the new policy were interregionally variable. In the North we observe an increase in number of households and size of the household herds (Reindriftsadministrasjonen 1987, Riseth 1989).

Without going into details about the policy, the conclusion seems to be that the new policy accelerated a process of resource use unbalances. The subsidies ment a relatively

[10] Note that this cooperation system was well established before the first step towards Saami autonomy was taken i Norway by establishment of the Saami Parliament in 1989.

great flow of cash into a society which was rather close to a subsistence way of living. Further we observe dysfunctions related to conflict of objectives (Kosmo 1991, Fjellheim 1986) and different situation analysis and priorities between descision makers (Riseth 1992). This resulted in a kind of a descision crisis (Riseth 1990).

Two examples of unintended consequenses of the new policy may prove informative:

* Kosmo & Lenvik (1985) emphasize that the descision situation of the household was not really taken into consideration. The pastoralists were peasants in their thinking with the total welfare of the family as main object. When getting more money than their fixed income end, the surplus would be invested in herd increase. The subsidy policy did not seriously take this into account. Subsidies should therefore be given on condition of a fullfilled slaughter claim[11].

* To get status of a Management Unit, the household according to the Act of Reindeer Herd Management (§ 4), needs permission from the Regional Board. All households were to be registered as the law was set into function. Mistakes were made with the first registartion and there had to be extra registrations. The final result was registration more mananagement units than planned. Nilsen and Mosli(1994) found that in stead of one unit per household many household had got 2 and some even 3 units, with increased subsidies as a reult.

The Act of Reindeer Herd Management (§2) claimed that there was set a maximum number of reindeer per pasture district. In addition it gave title to setting maximum animal quotas per management unit (owner).[12] The Agency proposed implementing both types of regulations for the whole country. In the North the herders were very sceptic towards this proposal. However during the 1980-ies maximum numbers for each pasture district were set. Due to resistance from the owners and their organizations qoutas per managemnt unit are stil not set.

Combined with the general dynamics of the modernisation process, we may now put forward a multi-layer hypothesis for explaining the development:

* Possessive individualism and herd expansion are basic values competing with inherited and norm sanctioned pasture user rights. Thus there will be a pressure towards herd expansion as soon as nature and technology allows.
* The use of mechanized vehichles resulted in higher mobility and an increased potential for pressure on pastures.
* The attached increases in expenses increased the the need for herd expansion even more.
* Norm dissolution legitimated expansion on other herders traditionally accepted pasture "rights" and increased competition.
* State grants from the Agreement made investments in herd increase possible even for small units.

We find that the mechanisation process was a necessary and that subsidy money was a sufficient condition to trigger a spiral process of herd increase.

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[11] Herders with large herds should reduce their herds to get subsidies, middle ones shuld keep it stable while small herds could have some increase.

[12] Actually the idea was developed in the Saami district of the South.

This process seem to be reinforced by:

* lack of alternative **male** jobs [13].
* increase wage labor opportunities during the 1980's for young **women** which were bringing more money into the household (Nilsen & Mosli op.cit)
* reduced **grazing capacity** due to encroachments and increasing outdoor recreation use from urban people putting extended pressure on the competing siidas and households

We may note the traditional social norm system seems to have been a sufficient regulation mechanism in the period of tradional pastoralism. But as far as this was a milk based pastoralism, the production system in itself restricted the growth in number of animals. In the new situation with both increased internal tension and strong external pressure the old norm system seems insufficient to regulate pasture use. But here we need to remember that the transition to extensive meat based production had been going on for quite a period before overgrazing became a problem. This indicates that given the household organization and existing values mechanization and the introduction of the subsidy system have played a major role in causing the breakdown.

3.2 The South

Ecology

In the South Saami area the main traditional winter pastures are in the Swedish inland (pine) forests[14] (at Røros south on the Norwegian side), but also on islands and peninsulas on the Norwegian coast. The summer pastures are in the mountain ridge which the Norwegian-Swedish border follow. The bare mountain areas on the Norwegian side are divided by wide spruce forest areas rather sparsely populated by a farmer population. Most of the districts have no pastures in common with others. But there are exceptions. Some districts also have innatural borders which may create intermingling and stray animal problems with neighboring districts.

Culture and history

The South Saamis seem to differ from those of the North as to important cultural aspects. The culture historian Bjørn Aarseth explains:

> "Professor Israel Ruong...has emphasized the difference in attitudes between the South and the North concerning reindeer as private property. The South Saami have had a very strict view of the idividual reindeer as an object of property, and according to the tradition should theft of reindeer be punished by death. In the North "loan" of reindeer for food from another has not been considered a coarse crime. These different views ...

[13] People in Guovdageaidnu were fairly young and families with many children.

[14] The movement across the border is reduced since its origion in 1751 and the use of winter land in Sweden by Norwegian Saamis are today limited.

may, according to Ruong, follow the way herds were established. In the North groups of saami took control over whole herds of wild reindeer and had them under common watching while the South Saami tamed single reindeer and had small and very tame herds near up to our time. The milking of reindeer was practised very long. **The South Saami also seem to have been very careful not increasing the herds more than the pastures could carry** (our emphasize). Perhaps this attitude have a basis in ancient religious thoughts of connection with the Natural Spirits (saivo) in the family areas (Bergsland 1985). In the North ownership of a maximum of reindeer have been a predominant object for the reindeer owners" (Aarseth 1989:21, our translation).

In addition Aarseth (personal communication) points to the fact that the South Saami have a tradition not to let their herds be too visible. Herding in the South take place in areas surronded by farmers. Aarseth find their strategy natural since they feel threatened being in this situation. There are just a few known examples of destructive herd competition with resource depletion within the South Saami area (Ansgar Kosmo, pers. com.).

The exposition of the South Saami reindeer management to the settling Norwegian farmer society had strong policy implications already from the end of the 19th century:

* establishment of reindeer pasture districts (from 1892) to ensure farmers compensation for (alleged) damages on agricultural land.

* establishment of positions as Lapp Sheriffs (from 1894) which got the task of mediating specially the relationship pastoralists - settling farmers .

The rights of the pastoralists were in Bromleys terms considered and treated as **"non-property."** The consequenses are as Bromley (1991:28) describes "If pastoralists are regarded as politically marginal ... then the property regimes central to pastoralism will be only indifferently protected against threat from others."

Two cases

There are rather few descriptions of the development of the South Saami reindeer management. We will look at two cases. One in South Troendalag and another in North Troendelag.

South -Troendelag

Here we look at a district at Røros which have their own summer pastures, but winter pasture in common with their neighbouring district. At the time of the establishment of the Røros copper mines (1644), the Norwegian farmer population was very limited in these parts of the country. During the 18th and 19th centuries there were several waves of agricultural settlement expansion into the Saami areas (Falkenberg 1988).

Based upon ethnograpic fieldwork from the 1940s Falkenberg (1985) has given a close analysis of the process of cultural change which resulted in sedentary settlement of the Røros Saami in the time period about 1900-1940. The first clear sign of breakdown of the

traditional culture of pastoralism was that the intensive summer milking disappeared in the period 1901-32. Falkenberg points out the establishment of reindeer pasture districts as the external cause for this:

* The district establishment forced small owners which had made up small summer siidas of a couple of household two join greater common herds. This made the continued milking difficult.

* Compensation processes for reindeer damage on agricultural land resulted in heavily increased money expenditures. Higher meat prices and better sale abilities were incitaments for the transition from subsistence milk and meat production to market meat production.

Falkenberg shows how this change had consequenses for the whole mode of production. A radical change in herding occured. The end of milking and clearly reduced wolf predation caused a more extensive herding which also was physically more demanding. As in the North herding became a pure male occupation and created a need for a central equipment base for the herders. The result was that women children and old people became sedentary and moved into wooden houses. The difference is that this process started much earlier in the South and was brought to an end before 1940.

The story of the development from the 2nd World War up to about 1970 is told by Elgvin (1993). He stresses the increased problems with herding, animals straying to neighbouring areas and that the pastoralists got problems with marking them. According to the Act of Reindeer Herd Management mavericks[15] was state property which should be sold for the income of a Reindeer Management Fund which was to be mangaged by the authorities. The owners refused but lost a legal process where the final judgement was made by the Norwegian Supreme Court. The pastoralists had to obey the will of the local authorities and agreed to organize both *herding and husbandry in common*. In spite of this reorganisation, the return from their reindeer husbandry was too small for their living.

Several attempts were made to improve the situation. Two owners tried to domesticate and feed calves inside a fence. At the same time the snowmobile came and all wild reindeer was slaughtered. Increased bull slaughter was tried. Another South Saami district had experience with calf slaughter. In other words; the pastoralists had started practical experiments with the herd structure.

A family group consisting of the biggest owners, took the intiative which became successful. All the 11 households owners in the district (two sidas) agreed upon:

- adjustment of the total district herd to the pasture resources
- animal (indirectly pasture) quotas with rather even allocation of reindeer numbers between the households - voluntary set, but later approved by the authorities.
- systematic work to improve the biological productivity

[15] Animals without the traditional earmarks.

As a contrast to the North, animal quotas was easily intoduced. The idea was developed from inside. And after some years this was realized as the result of an intimate cooperation between the herders and the new Lapp sheriff Dag Lenvik which was a husbandry scientist[16]. The combination of his professional skills and the reindeer owners practical knowledge resulted in a development which in a period of about 15 years doubled the productivity of their district. The core of this process was a new slaughter strategy. Extended calf slaughter restructured the herds imposing a much higher doe share. The outcome was **an increased biological productivity**. This was was made possible through a special subsidy offered from the Agreement of Reindeer Management - the calf slaughter grants which compensated income loss compared to traditional slaughter strategy.

North-Troendelag

The reindeer management of this county covers the area from the Swedish border to the coast. According to Fjellheim (1991) the influence from the more extensive Swedish reindeer management explains an uneven development pattern where the "inner" districts left intensive milking and meat subsistence pastoralism about 1930 while "outer" districts continued into the postwar period.

An analysis of one of the inner districts is given by Ramstad (1967). He emphasizes that the district practised an extensive great herd reindeer management with a year-around use of a wide mountain area. This management claimed young and strong men, periodic hard work in the mountains. Fences, skis and snowmobiles were used to gather the herd. The siida consisted of 6-12 household on account of the need for male labour force. There existed no clear leader and hard competition between siidas, but also partnership across siida limits.

In addition to the influence from neighbours on the Swedish side of the border this district was heavily affected by the consequences of hydroelectric power regulation which caused the end of movements for summer fishing (Kosmo 1988).

Ramstad observed that discontent with the situation (way of management) were widespread. It did not create acceptable returns, and the herders felt that their practise was in conflict with traditional ideals. He emphasize that some wish to get back to the old intensive herding while others wish to organize the reindeer management and the Saami settlements in a way that connects more Saami to the herd management directly in herding or in processing, trade or service.

The Saami population was searching for a better way of doing things. In this situation the ideas from Røros started to spread. Also in this case expertise from outside was important.

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[16] Lenvik had a M.S. in animal husbandry and research experience. He started at Røros in 1969. The strategy he developed together with the pioneer Anders Fjellheim is known as The Røros strategy and is documented in Lenviks Dr. agric thesis (Lenvik, 1989).

Ansgar Kosmo[17], the new Lapp Sheriff from 1973 like his fellow in South developed an extended cooperation with those of the owners which were interested in limiting herd size together with increase in productivity. By the end of the 1980s the district as one of more others had a productivity about 15 kg per spring herd animal and a stabilized pasture adaption. We should also mention that the erection of a Convention border fence in the early 1970s made it easier to conduct the herd management.

Tentativ interpretation

The empiric material for analysing the development in the South is so far thin. We will however suggest some elements of an explanation:

* The actual herd managment were unstable/gave low return and there was an understanding an will for changes among the pastoralists.

* The pastoral society had been in contact with the surrounding Norwegian farmer society for a long time. This made much harm for the Saamis, but it forced them to develop systems where they had good control over their pasturing. It also induced some mutual understanding across the cultural border, making communication with the Norwegian theorists possible.

* There were pastoral pioneers which could convince their partners of the need and possibility of change and could lead the carrying out.

* There were a limited number of households. The mountain areas were to a great extent divided by spruce valleys. We further observe limited or manageable competition from neighbouring reindeer herders and a tradition for small siidas and a culture for limiting herd expansion.

* The public subsidy policy suited a reconversion of the type carried out in the South Saami area.

[17] He was an agricultural economist which also knew animal husbandry and had research experience.

Analysis and discussion

When comparing South and North we have to evaluate both internal and external factors. Starting with the internal, we observe difference in the dominant strategy for increase of welfare[18]:

-in the North; expansion in quantity (herd increase)
-in the South; expansion in quality (productivity)

It is hard to believe that this is a mere coincidence. It may be explained by cultural differences. The value of herd expansion seems to have been weaker in the South. This is illustrated by the fact that animal quotas were mainly an endogenously developed and successfully implemented idea of the South[19]. In the North such an idea "had to" come from outside and was as we have seen, refused.

The pace and form of the transition has also been clearly different. In the South the changes have been under way for a long time. The number of descision makers was also limited. In the North the reindeer herd management was relatively unaffected up to 1960. Then a series of changes followed suit in high pace. The number of descision makers which had to coordinate their descisions was considerable.

As to the external factors, they are in principle the same, but vary in phase strength and timing. In the South the influence of the Norwegian society was considerable already by the turn of the century. However the South Saamis were able to adjust to the pressure. In the North the influence was limited up until 1960. But as we have seen, the North from then on faced several transition processes simultaneously.

As an irony of fate the South Saami were in a way "lucky" beeing few and having to adjust early to the pressure from Norwegian farmers etc. They had to develop better systems of herd control. Further it seems as the search for new alternatives and openness towards theoretical knowledge were keys to the success of the transition in the South. For the North the period 1960-1985 seems to have been a more or less continually adjustment to external changes with little capasity to find new solutions.[20]

Going back to the theory and Ostroms (1990) suggested design principles, we will try to summarize the differences in regional development:

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[18] Eventually also compensation for increasing subsistence needs.

[19] The first written source we have registered so far is the 1966 proposal of a Law committe were the pioneer Anders Fjellheim took part. The title came into the 1979 Act. In South the formal regulations have been made afterwards confirming the internal agreements made.

[20] The last decade (1985-1995) has been far more offensive, but a discussion of this period would blast the limits for this paper.

PRINCIPLE	NORTH	SOUTH
1) **Clearly defined boundaries**	Clear CPR boundaries. "Grey" establishment of new units.	Strong external pressure on CPR boundaries .
2) **Congruence between rules / conditions**	Unsifficient appropriation rules	Congruence appropriation rules and local conditions.
3) **Collective-choice arrangements**	Lack of traditional macrolevel. Organizational divsion today[21]	Few siidas . Possibilities for collective choice
4) **Monitoring**	Difficult on macrolevel	Small siidas. Own monitoring.
5) **Graduated sanctions**	Traditional sanctions not sufficient	
6) **Conflict-resolution mechanisms**		
7) **Rights to organize**	Relatively limited governmental influence before 1960. Authorities governing attempts from about 1975.	Governmental objectives of subordination under agriculture from 1980 .
8) **Nested enterprises**	Weak common level .Some selforganizing today.	

Ostroms principles underlines the importance of the appropriators own governing and extend the explanations given initially. Especially the different fate of the animal qouta regime in the South and the North illustrates this. We would also like to stress the weigth put on equity in the solutions of the South. This is also in accordance with the program of Ostrom.

Need for further research

Most of the conclusions arrived at above are based on secondary sources, partly developed for other purposes than the ones we have. This creates several uncertainties as to the interpretations. Some may never be eliminated. But there exist possibilities for a better documentation both through exploring written sources and by interviews. We will espesially stress the need for a better insight in the land use right system and the

[21] After a change of leader in NRL, the State and the Assosciation became rather close in objectives and a more restrictive policy was developed and implanted. NRL was losing credibility among own members in Guovdageaidnu and Karasjok and a rival organisation to NRL called BES was founded. Traditionalism and oppsition against NRLs cooperation with the state formed its main basis (Paine, 1994, pp 179-181). The new organisation achieved considerable support from the pastoralists in North, but did not achieve status as participant in the annual negotiations.

traditional set of connected sanctions. Further we want to get a better understanding of the authority and value systems of the different regions, and how these have adapted to the process of modernization.

To us the lack of strong control mechanisms seem to be the most vulnerable part of the common property systems studied. Thus it seems importan to understand the control mechanisms of the new successful system of the South and the problems with copying them in the North better.

Finally the process of changing mode of production is fairly well known. But there are important unanswered questions related to the interplay between internal and external forces. The development over the last 10 years in the North is very interesting. There have been changes in policy and the number of reindeer is reduced to some extent. Experiments with fences dividing the autumn pastures have been undertaken, and one is trying to connect each area to a summer district and combine this with intensified autumn slaughter. The potentials of this strategy is a controversial topic and need to be thoroughly analysed.

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