

Chapter 10

The Phenomenon of Entrepreneurship in Reindeer Husbandry in Yamal: Assessment of the Situation, Paradoxes, and Contradictions



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Abstract The chapter considers the development of domestic reindeer herding in the Yamal-Nenets Autonomous Region over the past 30 years in terms of an entrepreneurial paradigm. Individual reindeer herding families own almost 60% of all domestic reindeer in the region. The chapter describes two types of nomadic entrepreneurs: economically independent and those relying on state support as well as differences in their behavior patterns, cultural values, and nomadic routes. Two reindeer herding models are presented: the ‘meat model’ of the Yamalsky district and the ‘antler model’ of the Tazovsky and Priuralsky districts in Yamal. Both models determine the differences in terms of size, dynamics and structure of the herd, length of nomadic routes, structure of production income. Unlike the dominant point of view blaming irresponsible reindeer herders for the depletion of pastures, the authors of the article see the problem as an institutional one – the result of public policies that created wrong incentives for reindeer herding entrepreneurs in recent decades. This policy transferred them to the position of hired herders equal to the state workers. The authors propose reforms in Yamal reindeer herding that will ensure a decisive transition to an entrepreneurial model in reindeer husbandry and an algorithm for the reforms in the state support system.

Keywords Arctic entrepreneurship · Nomad entrepreneurs · Reindeer husbandry development model

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10.1 Introduction

Over the past 30 years, the Yamal-Nenets Autonomous Region has undergone a transition to an entrepreneurial model in reindeer husbandry. The region is the leader not only in Russia, but also globally in terms of the number of private reindeer belonging to nomadic families. Meanwhile, there are practically no studies on Yamal nomadic entrepreneurship (although there are some on private reindeer herding, e.g., for the Sámi (Departament informatsii i obszhestvennyh svyazei Yamalo-Nenetskogo Avtonomnogo Okruga, 2005)). The problems of nomadic entrepreneurship and reindeer herding entrepreneurs themselves (for example, the motives of their behavior), of their state support, are unclear and underexamined. The work by Yuzhakov (2017) is a rare exception. However, reindeer herders consider this area extremely important. Yet these problems are not exclusive to the Russian Arctic. As noted by E. Reinert, the same issues in the structure of scientific research on reindeer husbandry are seen in Norway: harmless topics dominate on the impact of climate change on the productivity of pastures, on the anthropology of reindeer husbandry, on the “tragedy of common property” (depletion of pastures as a result of overgrazing), but the topics of the effectiveness of state support for private reindeer herding units and public-private co-management in reindeer husbandry have been ignored by researchers (Reinert, 2006).

The work on the Yamal reindeer husbandry by our numerous colleagues Golovnev et al. (2014), Detter (2017), Klovok and Khrushchev (2004) and others concentrate on the clash of ways, the traditional reindeer herders and the oil and gas industry, on the economy of reindeer husbandry, on the problems of overgrazing, on the dynamics of Yamal reindeer husbandry against the situation in the whole Russian North and Arctic. Paradoxically, the reindeer herders of Yamal are more often studied as ethnic groups, as nomads, but not as entrepreneurs. The entrepreneurship of the nomadic households of the Autonomous Region is not considered something to be taken seriously, not worthy of separate research attention and study.

Our work is designed to bridge this gap. The object of the study was private reindeer herding in the form of nomadic family households in the Yamal, Tazovsky and Priuralsky districts of the Yamal-Nenets Autonomous Region, where the bulk of the personal livestock of the autonomous region and Russia are concentrated. There are about 3000 indigenous reindeer households here, which concentrate about 60% of the total livestock of the district (Departament informatsii i obszhestvennyh svyazei Yamalo-Nenetskogo Avtonomnogo Okruga, 2005). In the Tazovsky district alone (or in the two Yamalsky and Priuralsky districts taken together), there are more privately-owned reindeer than in the whole of Finland. Yamal has three times as many family-owned reindeer herders as Finland and nearly six times as many as Norway (Heikkinen, 2006; Reinert, 2006). The average size of a personal herd varies from 150 to 200 reindeer.

The informational basis of the work was the materials of our expeditionary surveys of Yamal reindeer herders from 2016 to 2019 at the Scientific Center for the Study of the Arctic, materials from a sociological study of the indigenous

small-numbered peoples of the North conducted by the authorities of the Yamal-Nenets Autonomous Region in 2005 and materials from our own field surveys in 2017, data from federal and regional statistics, including the All-Russian Agricultural Census of 2016, laws on reindeer husbandry in ten reindeer herding regions of Russia (in which the main livestock of domestic reindeer is concentrated), materials from the INTEGRUM regional press database. The chapter is based on the article published in the Arctic: ecology and economy journal (Pilyasov & Kibenko, 2020).

10.2 The Phenomenon of Yamal Private Reindeer Husbandry as an Entrepreneurial Activity

A combined comparative analysis of the region's place in terms of the total number of reindeer and the friendliness of the regional law towards nomad entrepreneurs in relation to the nomadic entrepreneur¹ (Table 10.1) did not reveal a direct

Table 10.1 Comparison of regional laws on reindeer husbandry in terms of their friendliness towards entrepreneurs

Region	Characteristics			
	Number of pages of regional law (year of the latest version)	Are entrepreneurs mentioned in the law?	Are the possibilities for granting land plots to (new) units?	Rating by the total number of domesticated reindeer in Russia
Yamal-Nenets Autonomous Region	4 (2016)	Yes	No	1
Nenets Autonomous Region	7 (2019)	Yes	Yes	2
Chukotka Autonomous Region	4 (2018)	No	No	3
Republic of Sakha (Yakutia)	6 (2009)	No	No	4
Krasnoyarsk Krai	5 (2017)	Yes	Yes	5
Republic of Komi	4 (2018)	Yes	Yes	6
Murmansk Oblast	6 (2013)	No	Yes	7
Khanty-Mansiysk Autonomous Region (Yugra)	3 (2013)	No	No	8
Kamchatka Krai	2 (2014)	No	No	9
Magadan Oblast	7 (2016)	No	Yes	10

¹For the list of regional reindeer husbandry legislation see [Appendix 10.1](#).

correspondence: the most friendly are the laws of the Nenets Autonomous Region (NAR), Krasnoyarsk Krai, and the Komi Republic, in which entrepreneurs are explicitly included in the law and the possibility of allocating land plots to new private units is provided. But among them, only NAR is among the top four in terms of total livestock, and the absolute leader in terms of the number of personal reindeer, the Yamal-Nenets Autonomous Region, has a rather laconic document in terms of the number of pages and is not very friendly towards reindeer herder entrepreneurs. Certainly, the phenomenon of Yamal private reindeer husbandry, where three-quarters of Russian personal reindeer are concentrated, deserves a more thorough – and separate – institutional arrangement.

Private family reindeer husbandry in Yamal should be viewed as a full-fledged small business. Only such a view allows us to understand the new motives of the economic behavior of nomads, which were hidden or did not appear during the period of the dominance of the model of state reindeer husbandry in the last decades of the Soviet era (1960s–1980s). At that time, the viability of Yamal reindeer husbandry as an industry was based on obtaining a scale of economy effect for the herd and the regional livestock as a whole. This made it possible to save costs when carrying out regular vaccinations, fighting wolves, carrying out other veterinary and zootechnical activities and ordering helicopters.

The transition to an entrepreneurial model has radically changed the economic effects that now determine the viability of the industry. These are, first of all, *spatial externalities*² – the flow of knowledge and experience from one nomadic entrepreneur to another as well as experienced personnel from former public units going to private family households, much greater diversity in the structure of the herd, related activities (traditional crafts like hunting, fishing and wildcrafting); great flexibility and maneuverability (up to daily intuitive improvisations) in grazing routes in terms of pasture conditions and proximity to the sales markets for reindeer meat and antlers; the mobility of the actual organizational structure of the small business itself and temporary coalitions in which it enters daily with neighbors, other relatives and the authorities.

The mobile motivations of individual reindeer herding entrepreneurs are precisely how the new emerging model of Yamal reindeer husbandry radically differs from the much more inertial, former and *frozen* state model. And the current problems of Yamal reindeer husbandry show to how psychologically difficult make it hard for the authorities at all levels to adapt to this extremely mobile new reality of the industry's development.

Within the entrepreneurial community of private reindeer herders, as our surveys have shown, there are two poles: forced, dependent on state support, and frontier, self-sufficient. Simultaneously, there is a third compromising (mixed) type of Yamal private reindeer husbandry within the described poles, which includes the features of the first and the second and therefore is more difficult to diagnose.

²In economics, externalities are positive or negative external effects that arise among “third parties” who are not directly involved in a market transaction.

The model of economic behavior of an obedient reindeer entrepreneur receives state support, does not mind becoming a state employee, follows the instructions of the district authorities regarding decisions on the delivery of meat (to which slaughter complexes, to which trading posts, through which community, what price etc.): *We hand over everything to the slaughterhouse, then we do not influence the selling price. If we do not hand it over, we will lose all the benefits.* This entrepreneur does not see the need for a transition to a new organizational model in Yamal reindeer husbandry; in the event of force majeure, he moves closer to the settlements, thinks more about preserving than about increasing the herd. The size of his herd is slightly larger than that needed for the subsistence level of a family (about 250 heads). It is this type of entrepreneur who masterly knows how to adapt to the criteria for obtaining all possible forms of state support, even in the face of constant changes in its rules and regulations.

The model of a self-sufficient private owner: does not get state support and does not have a legal status for it; highly values economic independence; has about 500 heads; solely responsible for making major decisions; relies on his experience and intuition; he does not need factories and stalls because he sells all the meat to his friends; receives all the supplies in the village/city; plans to increase livestock. Such entrepreneurs are characterized by regular *spreading onto* the pastures of other herders. It is in him that the denial of the sedentary lifestyle is very maximally strong.

His philosophy was clearly expressed by the head of the reindeer family household, A. Serotetto: *“A nomadic way of life is – you should not ask anyone for firewood or transport. You chose this path. You should roam and not ask anyone anything ... This is how the northern ones differ from the southern ones (in Yamalsky district) – the northern ones will never say that we have no firewood, no bread, or any other products. They know that since they have chosen this path, it means they have to work, as no one forbids them to stay at home”* (Departament informatsii i obszhestvennyh svyazei Yamalo-Nenetskogo Avtonomnogo Okruga, 2005: 193).

Within the three district leaders of the Yamal-Nenets Autonomous Region in the development of nomadic entrepreneurship – Yamalsky, Tazovsky and Priuralsky – two economic models are clearly distinguished: where the family business receives most production income from the sale of venison, and from antler production. The first model is typical for the Yamalsky district, the second for the Tazovsky and Priuralsky districts.

What factors determine the choice of a particular model by an entrepreneur? Of course, this is an institutional factor of the nature, scale, forms of state support for the district; the economic factor associated with state pricing policy for reindeer meat, as well as the timeliness of payments for the delivered meat and market dependence on the price of antlers and bone horns on the exchange rate; the infrastructural factor, understood primarily as the specifics of how local sales markets are organized in the form of a settlement system, trading posts, a procurement network; the geographical factor, understood as the proximity or transport distance from large local centers, including the proximity to other regions, which have a more attractive pricing policy regarding reindeer products and basic necessities for an entrepreneur.

Separately, one should note the factor of local anomalies (which directly affects the volume of supply of commercial products of a reindeer enterprise – meat, horns, antlers etc.) in the form of frequently recurring animal diseases here (i.e., brucellosis in the Tazovsky district), climatic epidemics,³ or, for example, a bright local leader within the entrepreneurial community of reindeer herders etc. It is in the sparse and not always predictable terms of climatic and social dynamics of Arctic spaces that the factor of local anomaly can reverse the influence of all other factors.

The Yamalsky district, due to the tradition that developed back in Soviet times (it was the forge of personnel for managing the agro-industrial complex of the whole region, convenient due to its proximity to the center of the region in the city of Salekhard) has become a kind of experimental platform, a showcase for state support of the industry in recent decades based on former state units and newly created municipal unitary enterprises. Since the Soviet period, the district has been considered a large procurement center in the region with relatively favorable conditions created for this (a network of slaughter complexes, trading posts). In Soviet times, the Yamalsky district served well to achieve the plan for harvesting meat (“meat model”), to comply with export obligations, and this recent history largely determined the existing model of entrepreneurial behavior of reindeer herders focused on a meat market and related fishing (for feeding the family and reindeer herding dogs, for additional income and in some cases for survival in the event of a significant loss of reindeer).

At the other extreme are the Tazovsky and Priuralsky districts, where nomadic entrepreneurs developed their business according to the *antler model*, which determines many of its characteristics. It is no coincidence that the most modest household indicators for venison production are here: reindeer are slaughtered in small quantities for personal consumption and cover the most critical urgent needs of families in the period between the delivery of bone horns and a campaign to collect antlers, when they are collected by land and air transport in exchange for fuels, food, various goods, and veterinary drugs, less often for money.

10.3 Paradoxes of Yamal Reindeer Husbandry: ‘Black’ Market or ‘White’ Market?

New market stereotypes for the behavior of private reindeer herders (at least some of them) have revealed numerous paradoxes in private reindeer husbandry in Yamal which are completely absent in other reindeer husbandry regions where private reindeer do not dominate in numbers. For example, Yamal is the only region in which the production of reindeer meat is radically lower than expected when compared with the total reindeer population (Fig. 10.1).

³The “climatic” epidemic here means the anthrax outbreak in Yamal provoked by the summer heat of 2016.

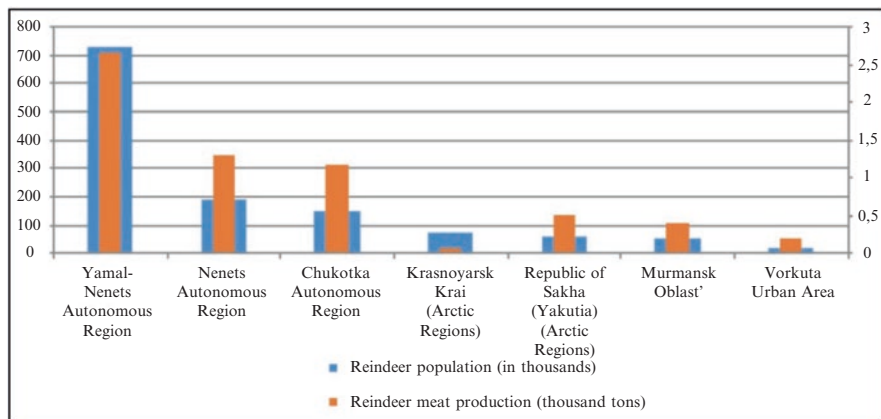


Fig. 10.1 Antlers or meat: black market or white market? Reindeer herding in the Russian Arctic zone, 2016. Source: Data from the Federal State Statistics Office (Rosstat) and internet sites. (By D.A. Sidorova, expert, autonomous non-commercial organization, Institute of Regional Consulting)

What are the reasons for non-compliance with the norms for delivery? Why does a reindeer herder avoid a particular slaughterhouse? The reason lies in the economic incentives formed for private entrepreneurs by the most important ratios of prices for venison and gasoline, venison and antlers. Understandably, within state reindeer husbandry in other regions, these comparative prices do not affect the economic behavior of herders to a great extent. In fact, Fig. 10.1 shows the role of the antlers market in which thousands of Yamal reindeer family households are involved.

Hereditary nomad Ivan Anagurichi from Panaevskaya tundra decided to postpone the slaughter of three hundred reindeer. The animals were saved from inevitable death by ... horns!

*The buyer for antlers showed up; the man rejoices. Gave a good price. I have more than two thousand heads in my herd, many horns have accumulated; if I sell, I'll get a lot of revenue. And let the reindeer live until next year ... Many tundra people adhere to similar tactics nowadays. Reindeer antlers are procured almost everywhere in Yamal.*⁴ (This is a statement from the electronic media "Myaso-portal", interview with Ivan Anagurichi).

The presence of two markets (the official venison market and the semi-official antlers market with his intermediaries, transport scheme, helicopters, etc.) form a drama within the private Yamal reindeer industry, not comparable with the situation in the state population. The meat market has historical roots while the antler market is more contemporary.

And the fact that both markets make a significant contribution to the incomes of private households in Yamal is confirmed by the data on the structure of herder family incomes (Tables 10.2 and 10.3).

⁴ <http://www.myaso-portal.ru/news/news-branches/iz-za-vysokogo-sprosa-na-panty-tundroviki-neokhotno-sdayut-zhivotnykh-na-myaso/>

Table 10.2 The structure of income of a family of reindeer herders in the Yamalsky district of the Yamal-Nenets Autonomous Region from the sale of reindeer husbandry products (Zuyev et al., 2017)

Product type	Share, %
Reindeer meat	66.6
Antlers	18.7
Bone horns	14.7
Total	100.0

Table 10.3 Income from the sale of reindeer husbandry products from the families of reindeer herders in the Tazovsky district of the Yamal-Nenets Autonomous Region (Gydanskaya tundra) (Kibenko, 2018)

Reindeer products	Total kg	Income at an average price, rubles	Share, %
Antlers, kg (n = 43)	11,647	14,512,162	67.4
Reindeer meat, heads	29745 ^a	4,878,180	22.7
Reindeer meat, carcasses ^b	82	1,230,000	5.7
Bone horns, kg (n = 42)	6184	909,048	4.2
Total		21,529,390	100.0

^aTotal weight is calculated based on an average slaughter weight of 45 kg

^bReindeer meat in carcasses – sales to the village or to buyers bypassing official slaughterhouses to get cash. In this case, meat was sold as carcasses by 9 families out of 50. In total, 82 carcasses of reindeer were sold during the year

Everything is different in these two markets: institutions, transport schemes, intermediary structures etc. The meat market set demands for the fat content of reindeer meat, the quality of meat, the presence of important animals for the regular reproduction of the herd; for the antlers market, the livestock of males is important, from which unique raw materials are cut. At the same time, it is wrong, as is customary among journalists, to denounce the greed of private reindeer herders who abandoned the work of their ancestors for the sake of antler gain and, uncontrollably increasing their livestock, and destroying pastures in the process.

Antler harvesting is an important source of additional income for private households. The collection of antlers occurs in the summer, far from settlements, when the herds are in the north, where there are no gas stations or shops and this is the only way to replenish the stocks of food and fuels from buyers at high prices, mainly through barter. *Pantovka* (cutting antlers for the purpose of selling them) does not allow reindeer herders to carry a lot of food and fuel to the north, but to buy on site, to pamper children who come to the tundra for the summer with their families.

This is an important element of insurance (you cannot put all your eggs in one basket, i.e., depend on one source of income like reindeer meat). And for small and medium-sized reindeer herding private households, such diversification of economic activities is critically important. In every district in the tundra there are reindeer-entrepreneurs who buy horns, antlers and *kamus* (deer shin pelt) themselves from close-knit reindeer herders and then resell them in villages at a higher price.

The antler business should not be allowed to develop illegally, predatory, unrestrained, in the format of rent seeking. And there are prerequisites for this. And this is precisely the niche for government regulation, which via long-term subsidies of reindeer herders per *head of deer* or the industry as a whole, without reference to the volume of meat delivered, on the contrary, itself stimulated their hunt for antler rent, and not efficient and eco-friendly sustainable management. That put this market at the mercy of clandestine resellers for sale in China and Korea, not having developed intelligible formats of regulation and certification over time. In one word, regulation is needed.

10.4 The Tragedy of the Commons in Yamal Reindeer Husbandry: Myth or Reality?

It seems very tempting to reduce many of the current problems of private Yamal reindeer herding to the *tragedy of the commons* model. The term was introduced by G. Hardin in 1968 in an article for the journal *Science* (Hardin, 1968). Indeed, the situation in Yamal reindeer husbandry seems to have developed canonically according to this model.

At first, in the state reindeer husbandry, the ecological capacity of pastures corresponded to the number of domesticated reindeer. Then, after the denationalization and privatization of the industry, private reindeer herders emerged with new incentives to make a profit, who, according to the *free-rider effect* at no cost and mercilessly (and with weak and ineffective state regulation of this process) exploited the rapidly growing population of their personal reindeer on public winter and summer pastures as a foraging resource, which caused their rapid depletion (primarily winter pastures). The real facts of the growing competition for pastures (such as young people wanting to separate from their parents and set up their own chum and get reindeer – these are the demographic reasons for overgrazing), satellite images of the lunar landscapes in the place of the formerly civilized reindeer moss in the center of the Yamal Peninsula seem to confirm this theory. The government is blaming the herders for pasture degradation.

However, with all the attractive simplicity of this theory, the real situation in private reindeer husbandry in Yamal is more complex and the interpretation of the problem of overgrazing only from the standpoint of the tragedy of commons (and therefore, the greed of the reindeer herders is to blame) has limitations. Overgrazing also existed in Soviet times, such as in the Chukotka Autonomous Region, when there was no trace of private use of common land ownership of pastures.

First, there is no chaotic system of common property pastures, but an established system of the traditional distribution of plots and regulation of pastures, which most herders adhere to (and only a few violate it). Therefore, the initial premise that these pastures are in *common property* does not correspond to real practice. The idea that private reindeer herders are predators who, in the name of profit, destroy the foundations of their future well-being strongly contradicts all the nature-compatible values

that have been asserted for centuries in the folklore of the indigenous peoples of the North.

Second, overgrazing⁵ and eroded landscape phenomenon is by no means a homogeneous and total phenomenon. On the contrary, we are talking about a very polarized phenomenon when *dormant* areas are combined with very depleted ones.

Third, it is impossible to unilaterally assume that reindeer herders are to blame for the current situation because *other conditions* have not been equal in recent decades: during this period, gas industry development in the north of Yamal accelerated significantly, even radically, and this caused the economic alienation of a part of the pastures previously used by herders.

Finally, let us state some general considerations on this matter. The direct coupling of *growth in a number of reindeer to overgrazing of pastures* greatly simplifies the natural reality of Yamal as a typical Arctic territory. This coupling is inspired by analogies of a totally controlled and predictable conveyor process in the form of standard animal husbandry, a meat factory where cows and bulls are grazed in a completely controlled environment. But the situation in reindeer husbandry is fundamentally different. Here, the environment is non-stationary and poorly controlled by human influence. This is a multifactorial reality in which the condition of pastures is influenced by many other factors than just reindeer grazing, climate cycles, constant changes in weather, and climate work (Reinert, 2006). These Arctic systems (this is their fundamental difference from natural systems of the temperate zone) are in high disequilibrium, and it is simply impossible to find a simple correspondence here between the number of animals and the capacity of pastures in the style of a closed unit.

In the collision of overgrazing, in which the reindeer herders are to blame, one can see a conflict between two polar types of knowledge: formal knowledge of biologists and tacit knowledge of reindeer herders. The knowledge of biologists is a model of ecological balance, when the livestock of domesticated reindeer, after high-amplitude fluctuations, *calms down* to a certain *harmonious* and stable level. The knowledge of reindeer herders is the unpredictability of the environment of rapid change and reliance on intuition. This knowledge has been accumulating for decades within a family of relatives who jointly graze a herd of reindeer. It is difficult to blame only one of them for it (Reinert et al., 2008). And only solutions based on the integration of knowledge will be sustainable and rational from the point of view of further development of Yamal private reindeer husbandry.

But the concept of the tragedy of commons, applied to the situation of Yamal private reindeer husbandry, is correct in one thing: the weak state regulations were the catalyst for the rapidly emerging problem of overgrazing. The laws on reindeer husbandry for the Yamal-Nenets Autonomous Region are the weakest in terms of environmental requirements compared to others (Table 10.4).

⁵The current reindeer population in the Yamal-Nenets Autonomous Region is almost twice the estimated reindeer capacity (Zuyev, 2015).

Table 10.4 Characteristics of regional laws on reindeer husbandry in terms of the environmental criteria

Criteria ^a	Is it possible to withdraw reindeer pastures for the use in the case of rules violation?	Is there a norm on the need to match reindeer capacity of pastures determined by land management?	Is there a norm for restoration of damaged cover and/or compensation for exploration and mining?	Ban on the movement of motor vehicles during the snowless period	Reindeer capacity control (sources)	Total score
Yamal-Nenets Autonomous Region	No	No	No	No	No	0
Nenets Autonomous Region	Yes (violation of carrying capacity)	Yes	No	Yes (except for special permits, emergency, etc.)	Yes (projects on pastures land management)	4
Chukotka Autonomous Region	No	No	No	No (on the contrary, delivery is important)	No	0
Republic of Sakha (Yakutia)	No	No	Yes	Yes (except for dedicated tracks)	No	2
Krasnoyarsk Krai	No	No	No	No	No	0
Republic of Komi	No	No	No	Yes (except for special government decisions)	No	1
Murmansk Oblast	Yes (in case of appropriate use)	Yes	Yes	Yes (except for dedicated tracks)	Yes (land management materials)	5
Khanty-Mansiysk Autonomous Region (Yugra)	No (but there are conditions for the provision of pastures)	Yes	No	No	Yes (projects on pastures land management)	2
Kamchatka Krai	No	No	No	No	No	0
Magadan Oblast	Yes	Yes	Yes	Yes (except for rescue, medical, emergency, etc.)	Yes (established by the regional government)	5

^aHaving read all regional laws on reindeer husbandry, we have selected these criteria as the principal ones to distinguish one from the other and therefore to compare them in a more informative way

The Yamal reindeer herding problems associated with overgrazing are not unique to the global Arctic. For example, in the Norwegian province of Finnmark, where three-quarters of all reindeer in the country are grazed (there are about 250,000 domesticated reindeer in Norway), there is also a very high spatial concentration of pastures used by private reindeer family households (especially in winter). Overgrazing problems emerged here as early as the 1980s. State measures aimed at forcing reindeer herders to reduce their personal herd are ineffective; the reindeer population is growing despite the tightening of the regulation (Johnsen, 2014).

As in the Yamal Peninsula, a compelling argument for the tragedy of commons is satellite images of lichens. A time series over 30 years, which scientifically provide the frontal logic of *fewer lichens – more reindeer, which means there are fewer of them because of the reindeer* (Behnke, 2000). However, more in-depth and multifactorial studies show an influence of not one, but a whole range of factors: climate change, government pricing policy, sanitary regulation of reindeer husbandry, etc. The combined effect of these factors leads to the fact that the reindeer herders themselves have very little influence on the development of their industry, that they not only cannot fully realize their malicious intent to snatch profit from their business but, on the contrary, are themselves hostages of significant changes in natural conditions and government tightening of the regulation (Reinert, 2006).

10.5 What Is to Be Done: Entrepreneurial Model, Adaptive Co-management, Polycentric Governance

Many features of the tragedy of common property that manifested itself in Yamal reindeer husbandry, with amendments to the specifics, have long been known and described in scientific literature. But the solutions to these problems, which go beyond the purely market or purely state-centralized, were also described in detail by the Nobel Laureate in Economics E. Ostrom in her book *Governing the Commons* (Ostrom, 1990). This book elucidates on self-governing institutions that allocate shared resources like communal land tenure, coastal fisheries, groundwater, water resources, and irrigation projects which have been successful for a long time. They may well be used to solve the problems in Yamal reindeer husbandry. It is important that these mechanisms are based on the already established reality of personal, family reindeer husbandry (and the reliance on personal interest inherent in this model, i.e., they do not require a return to public ownership of reindeer in one form or another), including algorithms for the collective use of limited pasture resources based on the regulation of this process by the participants themselves with the support of the State.

This system has three cornerstones: initial clarity and certainty in the formulation of the problem of pasture depletion; reliance on communication between all parties of the conflict – these are reindeer herders, resource corporations, and the state; a course toward the creation by reindeer herders of their own restrictive institutions.

The *first block*, in turn, is specified in the requirements for the accuracy and reliability of information (today, even the initial indicator of the number of domesticated reindeer in different information sources of the Autonomous Region differs by 25–30%; personal reindeer family households in all senses are *invisible*, absent from official registries and regulations) within clearly defined boundaries of the problem area; it will be important to determine whether the problem of overgrazing is being solved within the area where it is acutely identified (i.e., in the Tazovsky, Yamal and Priuralsky districts or within the outline of the entire autonomous region). An effective solution is obviously possible only with the utmost adequacy of local conditions, that is, via ways of recognizing the colossal heterogeneity of the tundra of Yamal and the need to develop a solution to the crisis for each of its sectors. Practice shows that if there are general recipes for well-being, then the ways out of the crisis are specific for each local entity.

The *second block* of effective and trusting communication puts the success of solving the problem in the hands of intermediaries of the authorities and the private reindeer herders, who can understand and hear both. In different countries, such intermediaries are lawyers, former reindeer herders who have become officials or national leaders, expert scientific consultants, etc. No less important are such intermediaries among the herders themselves, between the owners of large and small reindeer family households, and between social activists and personalities. After all, they need to impose voluntary systemic constraints on themselves. The experience of Norway shows that it was not possible to find such effective intermediaries among the Sámi herders and for communication between the Sámi and the State, which was the reason for the failure of government measures to regulate the number of reindeer. In establishing trust and open communication between all participants, the establishment and maintenance of permanent forums play a huge role as effective platforms for exchanging opinions and coordinating positions.

The *third block* of gradual institutional changes involving the reindeer herders themselves in creating norms and rules for themselves means the emergence of a new type of institutional entrepreneurship in their environment; these are people, who can propose their own or change the existing institutions of supervision and sanctions to control livestock, for the subsequent formalization by state bodies.

The ideal scheme for Yamal reindeer husbandry is the transition to the principles of adaptive self-governing co-management (Armitage et al., 2014) by granting the reindeer herders themselves the right to make key decisions, considering the existing restrictions. This is somewhat closer to the Finnish-Swedish model of private reindeer husbandry. However, of course, it is much easier to switch to such a model when the cost of the issue is lower when the total number of reindeer is small, and the significance of the issue is relatively limited against the background of other social problems. But, in Northern Norway, where the number of private reindeer is significantly higher, it has not yet been possible to switch to these principles due to influential political interests.

10.6 Mistake: Supporting Reindeer Husbandry as an Industry, Not as a Reindeer Entrepreneur

The problems faced by Yamal reindeer husbandry have risen to their full extent in recent years: anthrax, overgrazing of pastures, unsuccessful attempts to stabilize the number of domestic reindeer by directives, and the ineffectiveness of the system of economic support for reindeer husbandry are honestly acknowledged by the regional government itself:

“The legal norms for regulating the number of domesticated reindeer, established by the legislation of the autonomous region, regulating relations in the field of reindeer husbandry, do not work. There are no mechanisms for their implementation”.⁶

Why, despite the significant budgetary resources that are annually allocated to support reindeer husbandry in the Yamal-Nenets Autonomous Region (and the region has budget funds for this, unlike other reindeer herding regions, and this even plays a cruel joke on him because there is an illusion that a simple distribution of budgetary resources in various areas of development of reindeer husbandry can solve all its problems), the problems of the industry are aggravated, and it is not possible to come up with solutions that satisfy the herders themselves?

State support ignores the realities of the emerging new model of private, small, and medium entrepreneurial husbandry, which dominates the number of livestock in the region. Meanwhile, support is being given as if reindeer husbandry is still formed by a few large state units: there is no understanding of the new nature of a small business enterprise, which fundamentally differs from a large one in the motivation of the owners, in their economic behavior, interests, aspirations, super mobility etc. They are supported as if they were wage earners in the brigades of large state units.

This would not be frightening if private herding was a tiny fraction of total livestock, as it is in many other regions of the Russian North. But the Yamal challenge for state support is that private reindeer husbandry dominates here, and support is still focused on the industry, a large unit, where there is no entrepreneur as the leading agent of changes in the regional reindeer husbandry. There is a type of activity called reindeer herding that is eligible for state support; the animal (reindeer) is recognized, but there is recognition of the entrepreneur.

This is manifested, for example, in the ultimate unification of support as if all units were the same. But it is not so. There are strong and rapidly growing units; there are weak and even dependent private households. There is no encouragement to support strong entrepreneurs who are ready and willing to grow; state support deprives of any incentives for strong units which at best shun support or go into the shadows (black market), naturally fostering many weak and small units, which

⁶Resolution of the Government of the Yamal-Nenets Autonomous Region on the approval of the state program of the Yamal-Nenets Autonomous Region «District property management for 2014–2018» dated March 13, 2017, No. 171-P.

undermines the constructive dynamics of the industry. The system rewards obedient subsidy recipients and punishes herders with genuine entrepreneurial ambitions.

In Yamal, the failure of state policy is especially noticeable because the industry is dominated by a private herd, and the forms and measures of support are essentially old. State support is aimed at maintaining an inertial trajectory in which large state units are the main ones, but not at the formation of an entrepreneurial model of reindeer husbandry (paradox: there are personal reindeer, but there is no market-oriented system of state support for private reindeer herders).

Meanwhile, entrepreneurs differ from large state enterprises in that they react very quickly and flexibly to the changes of institutions. What is *digested* at state units in months and years is instantly reflected in the behavior of the entrepreneur and his business: going into the “shadow” (black market), switching to other markets, changing grazing routes etc. The regional government does not take into account the super mobility of the private nomadic business in response to institutional changes set by the measures of state support. In these new conditions, by quickly initiating and then gradually improving the institutions of state support, it is possible to ensure that reindeer herders will accept these state institutions and comply with the restrictions that they impose.

The most important instrument of economic support is always the price, the pricing strategy. There are special requirements for the specific conditions of Arctic domestic reindeer husbandry: Arctic areas and Arctic reindeer husbandry are subject to the strongest annual cyclical fluctuations. This distinguishes it from conventional, “conveyor” livestock herding.

A key element of the reindeer husbandry economy is the two different types of economic crises that these fluctuations create at the top and bottom of this cycle: crises of underproduction and overproduction. The crisis of underproduction arises partly with difficult accessibility and lack of food on winter and autumn-spring pastures, and the crisis of overproduction occurs under extremely favorable grazing conditions. The pricing policy must consider this inherent feature of the industry: ideally, when the price of venison rises during periods of underproduction and decreases during periods of overproduction. In reality, the purchase price is set without regard to these natural and climatic cycles. As a result, pricing policy exacerbates rather than diminishes the impact of negative climate fluctuations. The principle of price stability, e.g., for beef or pork, is transferred to domestic reindeer husbandry which has an essentially different, highly cyclic nature of production (Reinert, 2006).

Instead of a normal economic institution in the form of a price for meat, the response to underproduction is the constancy or increase in social subsidies for reindeer herders, while the price remains the same: the livestock has decreased sharply, the price is the same, less meat was sold, less income was received, but the subsidies were the same or more. As a result, the problems and instability within the nomadic business only increase.

But the price for venison contains another paradox that provokes instability in business. Normal entrepreneurship is impossible if the herder does not have the right to direct (legal) supply of products to the market. But this is precisely

what many, especially the poor and state-dependent reindeer herding entrepreneurs, are deprived of.

Under the conditions of state support, they are obliged to supply meat to *authorized* trading posts and slaughter complexes, where they are offered a reduced price against the conditions of a normal market. The State partially compensates for low purchase prices and, accordingly, the economic impoverishment of reindeer herders with social benefits. But this has nothing to do with the sustainability of their entrepreneurial activities. It is formed only at a fair price.

A paradox arises: wealthy reindeer herders, who already have relative financial security, strengthen it even more because they can sell meat in normal city markets at a fair price, and poor reindeer herders, tied to state support, must donate meat at slaughter complexes and get poorer due to the low purchase price. Formally, private reindeer herders resemble hired workers of public units who also do not own the product they produce and do not have control over key processes in the venison market: the procurement of reindeer meat and the sale and marketing of reindeer meat in the food markets.

For many decades, the main support measure for private reindeer herding in Yamal was subsidizing the head or branch, not produced reindeer meat. On the one hand, this ensured ease of reporting. On the other hand, it created the wrong incentives to increase livestock to work in the “shadow” antler market. It turns out that the State by its own hands encouraged entrepreneurs to leave the legal local meat market for the illegal Asian antlers market. At the same time, the State did not have an official price for the surrendered antlers, i.e., initially, this entire market became clandestine and was left at the mercy of various intermediaries.

Given the multiplicity of activities carried out by a private family in reindeer husbandry, it would be more correct to set the main subsidy per ruble on value-added from any legal type of activity (production of meat, antlers, fishing, fur trade, tourism, etc.), or attach the support to kilograms of meat being handed over for the first time.

The veterinary services critical to reindeer husbandry do not consider the modern capillary organizational structure of the industry, woven from thousands of private households. It is much easier to work with large state units and get the effect of the economy of scale here to save costs. But, as the case of anthrax showed, the fact that the veterinary services do not cover small units affects both small private and large state units when the epidemic begins.

Over the past 20 years, the average weight of a Yamal reindeer has decreased by one and a half times. But it is impossible to carry out pedigree work only at state units, and how to organize it among thousands of private households is not determined by any normative acts of the Yamal-Nenets Autonomous Region.

Many measures of state support for private reindeer husbandry, to be successful, should provide for the possibility of general, collective actions on the part of nomadic entrepreneurs (not only government agencies), for example, in case of fires in pastures or when wolves attack, during veterinary work, in support of pedigree reindeer husbandry, etc. Today, support for the industry, which in its implicit inertial form retains the previous approaches directed at large state units, by default

proceeds from the premise of the internal unity of all enterprises, a single labor market in the industry, a single personnel policy, etc. Yet this unity does not exist. It is needed to provide it. Establishing collective action means encouraging the cooperation of private households in the general need for sales, services, etc.

Compared with failures in the economic stimulation of private reindeer households by the *right* new institutions, the social side of supporting the families of reindeer herders looks very good. For example, in the overall structure of incomes of families of entrepreneurs-reindeer herders of the Yamal region, the share of social support of all types is more than 45% (Table 10.5). In accordance with the legislation on guarantees and rights of the peoples of the North, reindeer herder families enjoy all types of state support and even more generously than in other reindeer herding regions. There is *nomadic* money in the region, which is a monthly allowance for indigenous people leading a nomadic lifestyle; compensation payments for children who do not attend kindergarten; district governments provide non-material assistance to the tundra people in the form of non-food items (stoves, cloth, tarpaulin, generators, etc.), bring in scarce firewood, etc.

It is interesting to compare the support of private Yamal reindeer herding with the Scandinavian experience (Sweden, Finland, and Norway). Within the three Scandinavian countries of Sámi private reindeer husbandry, it is easy to distinguish Finland and Sweden on the one hand from Norway on the other, which has the largest livestock of Sámi domesticated reindeer.

Support for self-regulation and self-government, decentralization in decision-making on priorities and specific measures are not found in the country with the most numerous livestock, but, on the contrary, in Finland and Sweden (there is a kind of inverse relationship where reindeer herding entrepreneurs have more control in the development of the industry where there is less livestock). In Norway, the industry is characterized by extreme overregulation and a complete lack of control from below, from the reindeer herders themselves (Reinert, 2006; Reinert et al., 2008).

Table 10.5 The general structure of income of the family of reindeer herders in the Yamalsky district of the Yamal-Nenets Autonomous Region, % (Kibenko et al., 2017)

Income type	Share, %
<i>From economic activities:</i>	54.2
Reindeer meat	22.1
Subsidiary activity	16.3
Realization of antlers	9.5
Bone horns	6.3
<i>Social support of all kinds:</i>	45.8
Pension payments	17.0
Social benefit («nomadic» money)	11.8
Inventory assistance	8.5
Social payment (for children who do not attend a preschool institution)	7.0
Social payment (child and other benefits)	1.5

The Finnish-Swedish support model is characterized by a minimum threshold in terms of numbers from which assistance is provided (300 reindeer in the south and 500 in the north). In Sweden, the price support for a slaughtered animal can be up to 20% of the net income from the sale of venison. Reindeer herders here receive compensation for grazing animals for kills by wolves and other predators, for losses from vehicles and the contamination of pastures due to the attributes of industrial activities. Reindeer herders themselves own the corals (slaughter); that is, they have control over critical elements of the value chain (Dana & Riseth, 2010).

On the other hand, the Norwegian support model is larger, but the degree of regulation of the private reindeer herder – the recipient of assistance there – is much higher. Unlike Finland and Sweden, Norway does not set a limit on the population from which support is provided, rather a *ceiling* where it stops (to stimulate a decrease in the number of livestock as a way to combat overgrazing). Since 1977, annual negotiations have been held on the level and conditions of subsidies which are constantly changing (therefore, the very adjustment of the entrepreneur-reindeer herder to the new rules becomes a profitable business).

There are various structures for the *care* of private reindeer herders; for example, special firms that are engaged in slaughtering reindeer and receive subsidies for this, a reindeer husbandry development fund for R & D in the industry, and reindeer herders' associations. However, these organizations do not reflect the voice and interests of independent entrepreneurs-reindeer herders, but in fact, are just a subdivision of the Ministry of Agriculture (Reinert, 2006).

10.7 A New Model of Reindeer Husbandry in Yamal: Small Business as the Key Agents for Change

In the winter of 2017, reindeer herders on private and community units in the Yamal, Priuralsky, Nadym, and Purovsky districts were asked to answer a questionnaire in which the question was: In your opinion, how should the new model of organizing Yamal reindeer husbandry look like? (To set priority on a five-point scale). Scored options included the widely discussed solutions for reindeer husbandry in the Yamal Autonomous Region. Among the responses of 20 heads of reindeer herding units, two positions can be clearly distinguished: hopes for a return to the Soviet state-controlled model (minority) and a course for the further development of the entrepreneurial model, the potential of private small and medium-sized businesses in Yamal reindeer husbandry (Table 10.6).

Along with this, there are general proposals that can be incorporated into any economic model (introduce new technologies, take a course towards intensifying the development of the industry, take voluntary commitments to reduce the herd etc.).

The radical changes in the internal structure of Yamal reindeer husbandry, which led to the emergence of thousands of small and medium-sized private reindeer family households instead of the previously existing dozen large state units, are still far

Table 10.6 Key proposals that received the highest number of points for the new model of Yamal reindeer husbandry

‘Soviet’ model	Entrepreneurial model
More large state units and fewer private ones	More private reindeer units and fewer state ones
More experienced herding units, with medium-sized number of reindeer, in which the <i>standard</i> is maintained	Strengthening insurance institutions in private reindeer husbandry
Focus on the community as the core of private reindeer husbandry in the district, which, as a network, consolidates private family units in one district	Differentiated system of state support: Considering the life cycle of a particular private reindeer herding business (growth, stabilization, decline), as well as the size of the individual unit (large or small)
	The freedom to sell reindeer meat and its marketing is completely in the hands of the reindeer herders themselves
	More pressure on income for traditional industries (fish, fur), tourism, to diversify sources of income and reduce the risks of reindeer husbandry
<p>Both groups agree on the necessity of: The voluntary commitment of each unit to reduce the livestock in overgrazing areas. Increasing the grazing area range with access to the forest-tundra zone. Replacement of the quantitative livestock increase with a qualitative improvement in herd structure and productivity. Purchasing and installing mobile meat processing plants along the grazing routes to reduce the number of reindeer in Yamal.</p>	

from complete, and a real change of models has not yet taken place because support does not yet encourage the development of entrepreneurship in the industry, does not take into account the phenomenon of the emergence of hundreds and thousands of nomad entrepreneurs. Yamal so far ignores the new effects and opportunities that the industry is providing with the emergence of a new private model for organizing domestic reindeer herding with the inclusion of entrepreneurial energy, new dynamics, and new incentives for the economic behavior of herders (when it is better to provide shepherds-entrepreneurs with a fishing rod rather than fish).

The potential of the former radically socialized model has been exhausted and the resources of the new entrepreneurial model are not mobilized. The industry has frozen in the worst intermediate state.

The new entrepreneurial model for the development of domestic reindeer husbandry in Yamal should be based primarily on small family businesses. It organically corresponds to the new configurations of the main resource of reindeer husbandry like pastures, which in recent decades, under the influence of a sharp increase in livestock and an increase in the scale of economic activity, the advance of forest landscapes to the north, to tundra territories, have become more small-contoured. The monotonous landscape of pastures turns into a patchy one. The recognition of the correctness of small- and medium- herd reindeer husbandry is supported not only by the institutional transformations that have taken place but also by the landscape and climatic dynamics.

The former *vertically integrated* model of the organization of the state industry is being replaced by a networked, decentralized one, with a huge role not of directive orders from the center, which, as a Communist party line, should certainly be implemented, but horizontal flows of knowledge, experience, implementing best practices from each other, collective training of neighboring private households which jointly face the challenges of the strongest temperature amplitudes and fast landscape dynamics (changes in the structure and areas of lichens).

To fully liberate the new effects that the entrepreneurial model for organizing reindeer husbandry brings, it must be recognized as a full-fledged, real business and not a leisure activity. This means that you need to rely on entrepreneurial energy. And this means decentralization of the right to make key decisions down to the private family households themselves.

If everything is already clear enough about the entrepreneurs themselves, their motivations, economic behavior, and incentives to which they react sharply and quickly, then regarding the position of the State we can say that it has not yet been formed, except for an acute declared desire to reduce the number of domesticated private reindeer and through this to reach a solution to the problem of the industry. But there will be no solution on this path; on the contrary, such measures will provoke a further crisis in the regional reindeer husbandry: a rigidly regulated *roller* can lead either to a massive departure into illegality (which is already happening) or refusal to engage in private business, which has become the object of strong administrative pressure. And this (at least initially) will exacerbate the already dramatic problems of the industry.

As for overgrazing, there is not one linear solution. It should be a systematic package of measures in which each participant (resource corporations, reindeer herders, state land administration, and reindeer husbandry regulation services) bears its own risks and responsibilities. It would be immoral to assign the solution to the problem of overgrazing only to the most politically weak participant in the conflict – the private reindeer herder.

10.8 Conclusion

The situation in Yamal domestic reindeer herding is difficult. It is itself an experiment on a global scale in terms of the scope of developed private reindeer husbandry (neither Norwegian, Finnish nor Swedish private Sámi reindeer husbandry can compete with the Yamal in terms of size and spatial coverage; and there are no close analogs in Russia either).

So far, all the main attempts at optimal solutions go beyond recognizing it as typical Arctic entrepreneurship. It will be constructive and correct, on the contrary, to return to the discussion of searching for solutions via the channel of an entrepreneurial model and its opportunities and limitations.

Government support and regulation do not consider the realities of the transition to an entrepreneurial model of reindeer husbandry, they are still focused on helping all units as if they were state-run and large. But the motivation in a private household is completely different from that of a state unit. The existing support, without considering these realities and new incentives for private households, is not able to solve the problems of the industry. On the contrary, it provokes their occurrence, such as an increase in livestock and problems of overgrazing.

Instead of the former centralized bureaucratic management of the industry, the emphasis should be on the self-organization of reindeer households from below, on feedback in response to decisions from above, on the decentralization of the practice of making key decisions with significantly greater access to them by the reindeer herders themselves and greater trust in the tacit knowledge of herders, which has in recent years been actively replaced by the knowledge of biologists and officials from the regional administration. In fact, this knowledge should enhance, complement, and not substitute one another in competition.

Instead of annually providing *fish* with social support to private reindeer herders, it is much more effective to train them to master the *fishing rod* skills of nomadic business and Arctic entrepreneurship. Yamal reindeer husbandry should be built from below, from the sole business economy and its strengthening as the basis, a new backbone for the development of the whole industry.

It is necessary to give reindeer herders the right to independently sell their products on the nearest markets, so they have incentives for responsible entrepreneurship and not the attitude of a hired worker of the state unit type. It is necessary to look for solutions along the lines of not suppressing but strengthening the impulses of entrepreneurship in family nomadic reindeer husbandry (Figs. 10.2 and 10.3).



Fig. 10.2 Selection of sled reindeer, Yamalsky district, Yamal-Nenets Autonomous Region, Russia (2017). (Photo: V. Kibenko)

Fig. 10.3 Setting up a dwelling, Yamalsky district, Yamal-Nenets Autonomous Region, Russia (2016). (Photo: V. Kibenko)



Appendix 10.1: Reindeer Husbandry Legislation

The chapter operates the latest editions of the regional laws on reindeer husbandry from the normative legal database “Consultant +”:

- the law of the Yamal-Nenets Autonomous Region “On reindeer herding in the Yamal-Nenets Autonomous Region” dated June 6, 2016, No. 34-ZAO,
- the law of the Nenets Autonomous Region “On reindeer husbandry in the Nenets Autonomous Region” dated December 6, 2016, No. 275-OZ (as amended on April 23, 2019, No. 73-OZ),
- the law of the Chukotka Autonomous Region (ChAR) “On state regulation and state support for the development of northern reindeer husbandry in Chukotka Autonomous Region” of June 8, 2007, No. 57-OZ (as amended on May 7, 2018, No. 24-OZ),
- the law of the Republic of Sakha (Yakutia) “On northern domestic reindeer herding” of June 25, 1997, No. 179- I (as amended on October 15, 2009, No. 736-3 No. 363-IV),
- the law of the Krasnoyarsk Krai “On state support of reindeer husbandry in the Krasnoyarsk Krai” dated December 11, 2012, No. 3-868 (as amended on 8 June 2017 No. 3-663),
- the Law of the Komi Republic “On reindeer husbandry in the Komi Republic” dated March 1, 2011, No. 18-RZ (as amended by dated November 29, 2018, No. 109-RZ),
- the law of the Murmansk region “On northern reindeer husbandry of the Murmansk region” dated January 14, 2003, No. 380-01-ZMO (as amended on December 20, 2013, No. 1704-01-ZMO),
- the law of the Kamchatka Krai “On state support of reindeer husbandry in the Kamchatka Krai” dated June 22, 2010, No. 477 (as amended on April 1, 2014, No. 402),

- the law of the Khanty-Mansiysk Autonomous Region (KhMAR) – Yugra “On development of northern reindeer husbandry in the Khanty-Mansiysk Autonomous Region – Yugra” dated July 7, 2004, No. 44-oz (as amended on September 30, 2013, No. 86-oz),
- the law of the Magadan region “On reindeer husbandry in the Magadan region” dated 10 June 2003 No. 361-OZ (as amended on July 4, 2016, No. 2048-OZ).

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