Evolution of the subsistence pattern of indigenous population of the coast of Southern Chukotka: energy and resources aspects

IOP Conf. Series: Earth and Environmental Science **302** (2019) 012077 doi:10.1088/1755-1315/302/1/012077

Evolution of the subsistence pattern of indigenous population of the coast of Southern Chukotka: energy and resources aspects

K B Klokov [1, 2]

[1] Saint Petersburg State University, Saint-Petersburg, 199034, Russia
[2] Peter the Great Museum of Anthropology and Ethnography (Kunstkamera), Russian Academy of Sciences, Russia,

k.b.klokov@gmail.com

Abstract. The aim of the research was to elucidate the changes in the subsistence patterns in Meinypilgyno village community located in the South of Chukotka on the Bering Sea coast near a spawning area of the large stock of red salmon. The research was based on modern interviews and data of the Polar Census 1926/27. The result was compared with case study of Chukchi pastoralists and Yupik communities made by Igor Krupnik (1983) in northern Chukotka. The population of Meinypilgyno was formed 90 years ago from two indigenous communities with different subsistence patterns and ecologic niches: Chukchi reindeer herders and Kereck fishermen and sea-mammal hunters. The Soviet and post-soviet economic and social reforms combined with Russian immigration changed indigenous life step by step. First, the Kereks blended in with the Chukchi community, and then the Chukchies lost their reindeer husbandry and began to merge with the Russians. Meinypilgyno became biethnic Chukchi-Russian community focused on red salmon fishing. Presently, both ethnic groups use the same ecologic niche. The analyses of the evolution of the subsistence patterns in Meinypilgyno confirms the thesis that two communities with similar subsistence activities using one ecological niche are going either to clash, or to merge together.

1. Introduction

The subsistence economy of the indigenous population of the North is based on the use of the biologic resources. In this article, I have tried to elucidate the changes in the subsistence patterns of two communities of indigenous population located on the coast of Southern Chukotka for the past 90 years. I relied on methodological approaches by Igor Krupnik [1, 2, 3], including the offered by him term *subsistence pattern* and his method of food balance energy calculation [2], as well as the notion of ethnic community ecological niche [4, 5], and sustaining landscape [4, 6].

The case study was done in Meinypilgyno village situated in the Koriak highland on the Bering Sea coast. The village is located about 200 km south from the capital of Chukotka, the city of Anadyr, but it is difficult to get to it, because there are no roads in this area. A helicopter that flights 3-4 times a month is the only regular way to get there. There is neither industry nor agriculture, but social services are well developed. Although there are less than 500 inhabitants in the village, there is an Education Center (with a regular school, a kindergarten, and a children's art school), a hospital, a Cultural Center with a small Museum of ethnography, a post office, two shops and a bakery.

Meinypilgyno is located close to spawning area of the largest in Chukotka stock of red salmon (Oncorhynchus nerka), one of the most valuable species of the Pacific salmon. The significance of this spawning area may be judged from the fact that more than 200 tons of red salmon is caught annually during the past fifty years in this region, in addition to red salmon, humpback salmon (Oncorhynchus gorbuscha), arctic salmon (Salvelinus alpina) and a number of other valuable species of fish carry eggs [7].

The village is sited on a sand tongue separating the Bering Sea from a fresh-water channel, connecting two large fresh-water lagoons, the lakes of Pekulneiskoye and Vaamochka. Large stocks of red salmon pass along the channel to the lakes for spawning.

In 2016-2018, I interviewed several dozens of people living in Meinypilgyno. The data was compared with the data of the Polar Census related to the population and economy of the region in 1926/27 [8, 9]. The Polar Census was the first complete statistical survey of all northern regions of Russia. Due to difficult accessibility of the Arctic area, the census lasted two years (1926 and 1927). The Polar Census materials presented a unique source for studying the evolution of the subsistence patterns of the indigenous population, before they were changed by the soviet transformations. Its materials contain complete information not only about the population, but also about all kinds of traditional economic activities. They formed the basis for a series of special researches focused on the history of the economy of the indigenous peoples of the North of Russia [10, 11, 12, 13].

In my research the Polar Census data was interpreted by calculating the energy value of the food balance, similar to the method used by I. Krupnik [2] and M. Ragulina [11]. Further development of the subsistence pattern was studied at the qualitative level based on the interview data and different unpublished local documents (statistics, local economy reports, etc.) found at the local library and municipal administration in Meinypilgyno village.

2. Subsistence patterns of Kereks and Chukchies in 1920s

Initially, the population of Meinypilgyno was formed of the Chukchies and the Kerecks. The Chukchies inhabited the region in the first half of the XVIII century, they migrated there together with their domesticated reindeer herds from the North, from across the Anadyr river [14].

The Kerecks is a small and little known people who lived on the Pacific coast in the area of the Koriak highlands. They are close to the Koryaks. The information about them is very controversial and not accurate. In the course of population censuses, the Kerecks were often included in the number of the Koriaks. V.V. Leontiev [15, 16] reports the aggregate data of this people: there were about 600 Kerecks at the beginning of the XX century, in 1927 they were 315, in 1937 – 152, in 1959 – 64 [16]. During the Census of 2010 only 4 persons wrote themselves as Kerecks. Presently, there is nobody in Meinypilgyno who call oneself a Kereck, but there are descendants of intermarriages between Kerecks and Chukchies.

Meinypilgyno dwellers' predecessors were the Kereck families who lived in very small seasonal settlements at the seaside of Navarinsky Peninsula (at a distance of 50-100 km to the north of the present location of the village), and in the basins of lakes Pekulneiskoye and Vaamochka as well. According to the Polar Census 1927/26 data [8], there were 30 Kereck households there, and only 124 persons (table 1). A typical Kereck settlement included 1-2 dug-outs and 1-3 traditional mobile dwellings (tents). From 1 to 5 dogsleds and one large skin-covered boat belonged to each of them. Each household had a fishing net, some people used fishing weirs and other traps for fishing. Majority of the families had a rifle for sea-mammals hunting, and several metal traps for fur animals. During a year (1926/27), one Kereck household caught on average 1,644 kg of red and arctic salmon and 75 kg of herring. Two thirds of Kereck households dealt with sea-mammals hunting, killing seals and walruses (table 2). Small gaming was also traditional for the Kerecks. They caught arctic ground squirrel (Spermophilus parryi) and black-capped marmot (Marmota camtschatica, P.) with nets and snares, and seabirds nesting on the rocks with special nets.

Using I. Krupnik's technique and data on energy value of different kinds of fish and meat [2, 17, 18], energy efficiency of a Kereck's household may be assessed. The total energy value of their annual

harvest was about 2,778 10^3 kcal per family a year, including: fish 2,437 10^3 kcal., walruses and seals – 230, birds and small mammals – 111. Taking, according to Krupnik [2], a person's mean demand for food energy equal to 900 10^3 kcal per year, it may be determined that an average Kereck's household (4.1 persons) 75 % satisfied their energy demand. Thus, the energy efficiency of the Kerecks subsistence pattern was significantly lower than that of the of Siberian Yupik communities in the north of Chukotka, whose harvest usually exceeded their energy demands, that is the energy efficiency of their subsistence pattern surpassed 100 % [2]. The deficit in energy balance of the Kerecks' subsistence pattern appears to have been covered at the expense of barter trade. According to the Polar Census data [9], they harvested a significant number of fur-bearing mammals and exchanged fur skins for different goods, including flour, vegetable oil, tea, sugar, etc.

Table 1. List of local indigenous groups in the area of Meinypilgyno in 1927

Name of local group	Ethnicity	Number of house-holds	Population number (persons)	Number of dug-outs	Number of mobile dwellings (tents)
Ama River	Kerek	2	7	2	2
Amaama Bay	Kerek	2	9	1	2
Keniut River	Kerek	4	13	1	2
Keniut Bay	Kerek	4	13	2	2
Meluveem River	Kerek	2	15	1	1
Maina-Amamkut River	Kerek	1	4	1	1
Upangm'e	Kerek	3	10	2	3
Ugol'naia Bay	Kerek	2	7	1	2
Khatyn' River	Kerek	3	12	1	2
Vaatvet-Keneut River	Chukchi	8	42	-	15
Kaipyl'chin Lake	Chukchi	17	91	-	33
Nikepekel' River	Chukchi	6	27	-	12
Mainy-Pylgen River	Mixed	18	81	-	29
Total		72	331	12	106

Source: calculated on the basis of Polar Census 1926/1927 data [9]

Both coastal Kereck communities and Chukchies pastoralists leading a nomadic life in the basins of lakes Pekulneiskoye and Vaamochka were the predecessors of Meinypilgyno inhabitants. According to the Polar Census data [9], there were 41 households of 206 people with 9,528 reindeer (on average, 232 reindeer per household). Some households also possessed sledge dogs (total 21 dogs). Chukchies also had fishing nets and they harvested red and arctic Salmon. Two thirds of households were engaged in fur trapping, and one third took part in seal and walrus hunting.

The documents of the Polar Census [8] do not contain any information on reindeer slaughter, so there is no opportunity to carry out the similar calculation of energy efficiency for the Chukchies, as we did for the Kerecks. However, it may be assessed indirectly on the grounds of the average number of reindeer per one nomadic family. Thus, according to I. Krupnik's calculations [2], Chukchies reindeer herders communities in the North of Chukotka in 1926-1931 possessed about 265 reindeer per a family and satisfied their own food energy demands by 53-58 %. Therefore, it can be assumed,

that in the Meinypilgyno area, reindeer herding also provided approximately about a half of the Chukchi pastoralists’ energy needs.

A typical Chukchi family, in 1927, consisted of 5.0 people, so the family demand for food energy may be calculated as 5 persons X 900 10^3 kcal = 4,500 10^3 kcal a year. The calculation shows that 25 % of this demand was met at the expense of fish and small game harvesting reported in the Polar Census documents (table 2). The remaining part was to be met due to reindeer herding products and trade. Reindeer husbandry supplied both meat and reindeer skins which, together with fur animal skins could be sold or exchanged for different goods, for example flour and other products. The Meinypilgyno Chukchies’ subsistence pattern sustainability is thought to have been maintained due to the barter trade with Kerecks, similar to that of northern Chukchies and Yupiks [2].

Table 2. Subsistence activities of Kerek’s and Chukchi’s households in the area of Meinypilgyno in 1926/27 (per one household per year)

Indicators	Unit of measure	Kerek households	Chukchi households
Fishing equipment			
Skin-covered boats	number	1	-
Fishing nets	number	1.1	0.6
Fishing weirs	number	0.3	-
Fish harvest			
Total fish harvest	kg	2821	1025
incl. Red Salmon	number	549	223
Hunting equipment			
Rifles	number	0.9	0.8
Metallic traps	number	9.9	2.6
Mammals and bird harvest			
Walruses	number	0.24	0.29
Seals	number	9.4	1.1
Marmots	number	1.5	0.1
Ground squirrels	number	7.8	1.8
Sea birds	number	94.2	-
Geese and ducks	number	2.9	2.0
Foxes	number	1.6	1.5
Polar foxes	number	3.0	0.4

Source: calculated on the base of data of Polar Census 1926/1927 (Mainy-Pylgen River mixed group has been excluded) [9]

3. Subsistence pattern evolution

Some years after the Polar Census, the period of the Soviet reforms started. By 1935, the Kerecks had been united in the kolkhoz named “Kereck”, and nomadic Chukchies joined the “Krasnoye Znamya” (“Red Flag”) and the “Novyi Byt” (“New Life”) reindeer husbandry partnerships, which later were merged into the kolkhoz named “Druzhba” ("Friendship"). A new facility for fish storage and primary fish processing was constructed. When the salmon spawning run started Kerecks and Chukchies from the nearby territories came and set up their tents around it. In the end of the 1930s the construction of the wooden houses was begun. The village of Meinypilgyno appeared and became the center of the both kolkhozes: the Kerecks’ fishing one and the Chukchies reindeer herders’ one. Later, in 1967, the two kolkhozes were merged into one big sovkhoz, which was also named “Druzhba”. It existed until the year of 1997 and then collapsed having failed to withstand market reforms of the 1990s.

The Soviet economic and social reforms changed subsistence patterns of indigenous peoples. The Kereck households scattered over the coast line of Navarinsky Peninsula were rehoused to Meinypilgyno, closer to the main red salmon spawning areas which were located in the basin of Pekulneiskoe and Vaamochka lakes. Thus, the total amount of available resources increased, although the vast breeding colonies of seabirds (more than 1,000,000 birds [7]) on the rocks of Navarinsky Peninsula became inaccessible for Kereks.

Due to the Soviet reforms the subsistence pattern efficiency of Chukchi pastoralists increased. When compared with 1927, the reindeer stock grew by 150 %, and in 1960-1980 it was maintained at the level of 15,000 animals. Reindeer herders began to receive rather a high salary from the sovkhoz, in addition they were given apartments in Meinypilgyno for free. However, during the economic crisis in the end of the 1990s the “Druzhba” sovkhos collapsed and herders stopped being paid salaries. To feed their families, they slaughtered all domestic reindeer and switched over to fishery. Since 2001, reindeer herding in Meinypilgyno has ceased to exist.

In 2017, one of the former reindeer herders received a special grant from the Government of Chukotka, bought several hundred of reindeer in the neighbouring region and moved them closer to Meinypilgyno. However, he has not managed to increase his stock and his farm does not produce any reindeer meat for local community.

The Soviet reforms also affected the local population. After the “Druzhba” kolkhoz was created, an important part of the Chukchi pastoralists was forced to stop nomadism and to move to Meinypilgyno village together with Kereks. Thus, a biethnic community consisting of 62 % Chukchies and 38 % Kerecks was formed in the village. Convergence of the two ethnic groups occurred. The Chukchies having moved to the village became engaged in fishing together with Kerecks. Close contacts between them resulted in forming polyethnic families and fast assimilation of Kerecks.

In 1960-1980 dozens of Russian families came to Meinypilgyno. By 1989 due to migration and natural population increase, the village population grew up to 633, including 62 % of Chukchies, 0.5 % of Kerecks, and 37.5 % of non-indigenous (mostly Russians) [7]. The local administration seems to have registered many Kerecks as Chukchies. Later, during the economic crisis of the 1990s, the majority of Russians left the village. Presently, 450 people live in Meinypilgyno, including 85.5 % of Chukchies, and this number includes the Kereck descendants who lost their ethnic self-identification. According to the interviews, all the village dwellers have similar subsistence patterns, which almost do not depend on their ethnicity (table 3). Most residents are engaged in subsistence fishery. Only 111 persons (38 %) of working-age dwellers in the village have permanent jobs, mostly in the social services or in the housing and utilities infrastructure.

The Russians settled and naturalized in Meinypilgyno significantly influenced the subsistence pattern of the whole community. They initiated important innovations, which provided for the increase in fish capture. The channel between lakes Pekulneiskoe and Vaamochka is connected to the Bering Sea with an estuary through which red salmon enters in inland water bodies to breed. In winter, this part of the sea does not freeze but bulks of ice are formed in water. Waves bring vast amount of ice mixed with sand to the shore, they clog the estuary and block it. In the beginning of summer, while the estuary is closed, the red salmon spawning population cannot pass to breeding sites. To make the pass

of fish faster, Russian fishermen dug across the sand tongue with spades. The water level in the channel is high in spring, so the water immediately rushes even to a small pool and quickly washes out a new estuary of about 400 meters wide and up to 3-4 meters deep. During the past several years, earthmover was used instead of spades. If the estuary remains clogged, red salmon breed delays, and the amount of fish may decrease crucially.

According to the interviews, the Meinypilgyno dwellers’ dependence on local biological resources has decreased for the past decades, because part of people get income being employed or receiving welfare payments. But still, it remains rather significant, especially fishery (table 3). About 91 % of families are engaged in net fishery, annual mean take of fish is about 460 kg per family, approximately two thirds of it are used for feed, and one third is sold. Walrus hunting was actually completely ceased and seals harvesting was reduced, but geese and ducks hunting, gathering of mushrooms and berries are common. In addition, significant part of Chukchi families gather eggs of wild birds (mostly gulls).

Table 3. Participation of Meinypilgyno dwellers in subsistence activity, 2017, %

Subsistence activities	Indigenous families	Non-indigenous families
Net fishery	100	83.3
Angling fishery	91.7	85.7
Seal hunting	16.7	14.3
Bird hunting	41.7	42.9
Fur animal hunting and trapping	8.3	14.3
Sea bird egg gathering	25.0	-
Mushroom picking	83.3	85.7
Berring	91.7	85.7

Source: calculated on the data of a special survey of local residents, conducted during the preparation of the project of a natural park "Land of Spoon-billed Sandpiper" [7]

It should me remarked, that in addition to subsistence fishery there is as also a commercial one in Meinypilgyno. Two or three months a year a fish-factory ship works there. Local residents do not work for it, a fishing team is from other nearby villages. During the past decades the average amount of fish caught by the fish-factory ship was about 250-300 tons per year (depending on red salmon spawning run intensity), while all Meinypilgyno dwellers together harvested about 40 tons. All products of the fish-factory are exported from the region.

4. Discussion

To better understand the relationships discussed above, the notion of ecological niche of an ethnic community can be used. According to Iamskov [5], this approach is worthwhile when the research is focused on the historical evolution of the economy based on local resources or on the relationships of several ethnic groups inhabiting the same sustaining landscape. The notion of sustaining landscape is close to “feeding” (kormiaschii) or “encompassing” (vmeschaiuschii) landscape of Lev Gumilev [4]. It does not mean the natural landscape which evolves independently of Human, but it reflects an ecological relationship, in which social and economic activities of people regulate nature [6].

In his comparative cases study of energy balance in indigenous communities of sea-mammal hunters (Yupiks) and reindeer pastoralists (Chukchies) in northern Chukotka, I. Krupnik [2] concluded

that the relations between them were close to a symbiosis. The Yupiks’ subsistence pattern was more efficient than the reindeer herders’ one, as the Yupiks used to hunt in the places with very high concentration of the sea mammals. Via the traditional production exchange, pastoralists annually got the energetic “support” from the sea hunters’ community. The relations between the coastal Kerek community and Chukchi pastoralists described above were similar to the relations between Yupiks and Chukchies. In the 1920s the Kerecks community occupied the ecologic niche of sea coastal lagoon landscape, which abounded with anadromous fish, marine mammals, and seabirds. Chukchi pastoralists occupied another ecological niche: tundra landscapes where the main flow of biologic energy followed the food chains from producers – forage plants – to consumers of the first order – domestic reindeer, and then to the human. In both ecosystems, the food pyramids were topped by the human. Taking different ecologic niches in one and the same geographic area, Kerecks and Chukchies did not compete for food resources.

During 90 years, the relationship between both Kereks and Chukchies and their sustaining landscape as well as the ethnic composition of the Meinypilgyno community changed. Presently, the community comprises Chukchies and Russians together, and they have very similar subsistence patterns. Practically, both ethnic groups use the same ecologic niche. The total area of the sustaining landscape and the amount of available biological resources have decreased crucially. Reindeer pastures are no more in use actually, and the consumption of fish and sea mammals by local dwellers reduced greatly. On average, fish capture per family from 1927 to 2017 reduced by about 20 %. Nevertheless, the subsistence economy of Meinypilgyno community remains steady, as the large concentration of the red salmon resources “ties up” the local community to the coastal lagoon landscape. If these resources were unavailable, people would have left the area long ago.

5. Conclusions

The history of the evolution of the subsistence pattern of Meinypilgyno population confirms the thesis that two communities with similar subsistence patterns using one ecological niche are going either to clash, or to merge together [5]. In this case, conflicts did not arise. The Kereks blended in with the Chukchi community, and then the Chukchies having lost their reindeer husbandry began to merge with the Russians.

The high efficiency of subsistence patterns, due to the local concentration of salmon resources, continues to tie the multi-ethnic community to the sustaining landscape, as 2-3 months of intensive work can provide dwellers with food and modest income for the whole year. If it is not being disturbed by external drivers (for example, by industrial encroachment), this subsistence pattern may remain stable for a long time.

Acknowledgments

The research was supported by the Russian Science Foundation (project No. 18-18-00309).

References

[1] Krupnik I I 1989 *Arctic ethnoecology* (Moscow: Nauka, 1989) p 272 (in Russian)
[2] Krupnik I 1993 *Arctic Adaptations. Native whalers and reindeer herders if Northern Eurasia* (Hanover and London. Dartmouth College: University Press of New England) p 355
[3] Krupnik I 1993 Prehistoric Eskimo Whaling in the Arctic: Slaughter of Calves or Fortuitous Ecology? *Arctic Anthropology* **30 (1)** 1-12
[4] Gumilev L N 1993 *Ehnosphere: history of Human and history of Nature* (Moscow: Ecopros) p 544 (in Russian)
[5] Iamskov A N 2005 The concept of ecological niche in ethnoecology *Bulletin of the Moscow State Pedagogical University (Geographical issue)* **2 (9)** 48-60 (in Russian)
[6] Klokov K B 2011 The Sustaining Landscape and the Arctic Fox Trade in the European North of Russia 1926-1927. *In. D. Anderson (ed). The 1926/27 Soviet Polar Census Expeditions* (Oxford: Berghahn Books) 155-179

[7] Syroechkovskii E E et all 2018 *Ecological and economic justification of the creation of a natural park "Land of Spoon-billed Sandpiper" in Chukotsk Autonomous Area* (Moscow: BirdsRussui) Unpublished report (in Russian) p 373 (in Russian)
[8] *The economic census of the Subpolar North of the USSR. Territorial and group totals* 1929 (Moscow: Staizdat CSU USSR) p 255 (in Russian)
[9] *Results of the census of the northern outskirts of the Far Eastern Region (1926-1927): with the annex of a map of the northern outskirts of the Far Eastern District* 1929 (Blagoveshchensk: RSFR CSB. Far Eastern regional stat. Department.) p 296 (in Russian)
[10] Anderson D G (ed) 2011 *The 1926/27 Soviet polar census expeditions (Oxford: Berghahn Books)* p 332.
[11] Ragulina M V 2000 *Indigenous ethnic groups of the Siberian taiga: the motivation and structure of environmental management (using the example of the Tofalars and Evenks of the Irkutsk Region)* (Novosibirsk: publishing house of the SB RAS) p 164 (in Russian)
[12] Ragulina M V 2009 Traditional life support methods of the Evenki in the Baikal region Geography and N*atural Resources* **2** 109-166 (in Russian)
[13] Ragulina M V 2018 Indigenous Knowledge and Life Support of Nomadic Peoples of the Baikal Region: Issues of Intergenerational Transmission *Astra Salvensis,* **VI** 17-125
[14] Lebedev V V, Simchenko Iu B 1983 *Achaivaiam spring* (Moscow: Mysl’) p 143 (in Russian)
[15] Leont’ev V V 1976 *On the land of the ancient Kerek. Notes of ethnographer* (Magadan: Magadan book publishing) p 231 (in Russian)
[16] Leont’ev V V 1983 *Ethnography and folklore of the Kereks* (Moscow: Science) p 130 (in Russian)
[17] Foote D C 1970 Changing Resource Utilization by Eskimos in Northwestern Arctic Alaska, 1850-1962. *Proceedings of the VIIth Congress of Anthropological and Ethnological Sciences* (Moscow: Nauka) **10** 308-13
[18] Foote D C 1970 An Eskimo Sea-Mammal and Caribou-Hunting Economy: Human Ecology in Terms of Energy. *Proceedings of the 8th Congress of Anthropological and Ethnological Sciences* (Tokio and Osaka) **3** 262-67