Polar Science 21 (2019) 58–67

Contents lists available at ScienceDirect

Polar Science

journal homepage: www.elsevier.com/locate/polar

Post-Soviet population dynamics in the Russian Extreme North: A case of Chukotka

Kazuhiro Kumo[a,*], Tamara Litvinenko[b]

[a] Institute of Economic Research, Hitotsubashi University, 2-1 Naka, Kunitachi, Tokyo, Japan
[b] Institute of Geography, Russian Academy of Sciences (RAS), Russia

ARTICLE INFO

Keywords:
Chukotka
Population
Abandoned cities
Extreme North
Soviet policy

ABSTRACT

The main purposes of the paper is a study of the situation that emerged in the peripheral regions as a result of the state policy of the Soviet period, using the example of the demographic trends in the Chukotka Autonomous Okrug as one of the most distal Russian territories with respect to the center of Russia. The paper describes the migration flows in the Chukotka Autonomous Okrug as a whole, while the fifth section traces the processes of weakening and full closing of each separate settlement. Although the sharp decline in population in the Chukotka Autonomous Okrug was often mentioned in various materials, few specific research has been conducted with the main aim of studying this problem. As is well known, most of the USSR population lived in the European part of the country. At the same time, managing new territories was conducted in a planned manner toward Siberian regions, despite being situated far from large European markets. Presumably, these were attempts to obtain an effective return through the policy with ignoring economic principles. The resulting negative "return" of such state policy of regional management is shown by the present study.

1. Introduction

The purposes of the present study is a study of the situation that emerged in the peripheral regions as a result of the state policy of the Soviet period, using the example of the demographic trends in the Chukotka Autonomous Okrug as one of the most distal Russian territories with respect to the center of Russia.

The demographic-economic systems in the North are extremely unstable. The reasons for this are the region's dependence on the extraction of mineral resources, the fact that most human settlements are company towns, and the extremely high mobility of northern labor forces (Heleniak, 1999; Motrich, 2006; Petrov, 2010). On the other hand, some researchers believe that the presence of northern indigenous peoples who continue to utilize resources in traditional ways has maintained local stability (Duerden, 1992; Dudaev et al., 2013; Litvinenko, 2013). Nevertheless, it is not yet fully clear what characteristics make the local demographic systems and settlement patterns in the North stable on the whole, and what kinds of factors have affected their stability or instability. It is impossible to imagine what goes on in a specific territory based on these studies and the peculiarities of each specific region require additional examination. These very tasks were the main target of the given work. The detailed analysis of migration trends in the Chukotka Autonomous Okrug – the region with the most dramatic reduction in population in the post-Soviet period – dramatically exemplifies the results of the state policy for regional development.

As is well known, most of the USSR population lived in the European part of the country. At the same time, the Soviet state sought to open up northern regions in a planned manner throughout Siberia, despite being situated far from large European markets. Presumably, these were attempts to obtain an effective return through the policy with ignoring economic principles. The resulting negative "return" of such state policy of regional management is shown by the present study.

2. Russian Extreme North after the collapse of the Soviet Union

The decay of the USSR triggered large-scale changes, not only of the economic system, but also in the structure of population distribution patterns inside the country. Many studies have been dedicated to this topic (Kumo, 1997, 2003; 2007, 2017; Andrienko and Guriev, 2002), the main results will be explained below.

Sharp exodus was observed in the Far East and the Extreme North regions of Russia. Though the country's overall population is declining due to the mortality rate exceeding the birth rate (Karabchuk et al., 2017), migration inflow is observed nationwide. In the Far East and the

* Corresponding author.
E-mail address: kumo@ier.hit-u.ac.jp (K. Kumo).

https://doi.org/10.1016/j.polar.2018.11.002
Received 14 May 2018; Received in revised form 29 October 2018; Accepted 4 November 2018
Available online 20 November 2018
1873-9652/

Extreme North, with their young age structures, although the level of population decrease is lower than the overall figure in Russia, the outward migration flow considerably exceeds the national level, resulting in a sharp decrease in population in the region. In 1991 directly after the demise of the Soviet Union, the population of the Far East region comprised more than 8 million people, but had declined to 6180 thousands by 2017, i.e., by more than 24%.

The Soviet Union could retain its workforce in the economically poorly developed Far East and Extreme North regions thanks to politics which involved stimulating the population with high wages and consumer privileges. However, everything changed after the demise of the Soviet Union. Guaranteed state allowances to wages were considerably reduced, which prompted a decline in appealing consumer privileges. The delivery of consumer goods from the European portion of the country clashed with rocketing transportation expenses by railway and airline, with prices starting to exceed the purchasing capacity of the population and triggering a drastic drop in common living standards. As regards the production sphere, meanwhile, the increase in transport tariffs meant a fall in demand for Far Eastern end Extreme Northern products in the European part of Russia. The reduction of the production level resulted in the drop of income and overall pauperization of enterprises. The regions became the most loss-making region of the country. The life of Far Eastern and Extreme Northern regions directly depended on the delivery of oil and gas from the Western Siberia, but the sharp increase in expenses for their transportation resulted in the increase of price of energy carriers and even such large cities of the region as Vladivostok (Primorskiy kray) and Khabarovsk (Khabarovskiy kray) in winter time were hard up for fuel. Although under the stress of regional policy continuing since the Soviet times, the issue of improving these terittories' infrastructure was neglected and the gas lines, water supply lines and other important household utilities in the Far East and the Extreme North territory were considerably below the average Russian level (Vorob'yev, 1977). Under such circumstances, the large-scale exodus from the region may be considered a relatively logical consequence of the regional policy conducted during the Soviet era (Kumo, 2003, 2007).

Although the Extreme North regions have continued to receive central government aid since the collapse of the Soviet Union, the aid is no longer of a type that would encourage workers to move to these regions at all. In fact, the government has also adopted policies to encourage people to leave them (World Bank, 2005; Thompson, 2004).[1]

With this in mind, the population reduced by one third in the Chukotka Autonomous Okrug bordering with the High Arctic Zone, a decade or so after the demise of the Soviet Union (from 1991 to 2002) and in the Magadan Oblast also suffering from severe climate conditions during the same period the population declined by more than half. It should be noted that generally the nearly 10-percent exodus per year from a certain region is quite rare. It could be compared with a crisis putting the overall survivability of the given territory into question. Regional information in peripheral areas is rarely discussed in comparison with Moscow and other economically developed territories. Evidently however, the border regions are finding it a real challenge to face up to the consequences of the legacy of the Soviet regional policy. In the next section, the authors will discuss the situation of the Chukotka Autonomous Okrug, which demonstrates the most dramatic reduction in population out of all Far Eastern and Extreme Northern regions of Russia.

3. Demographic trends in Chukotka

The Chukotka Autonomous Okrug (Chukotka) is situated in the east end of Russia, directly next to Alaska (Fig. 1) and covers more than 720,000 km^2 (Source: *Regiony Rossii*, 2014, p. 629), which is almost twice the area of Japan (over 370,000 km^2), but out of the 83 administrative regions of the Russian state (the so-called “Federal Subjects“, excluding the Crimea Republic and the city of Sevastopol joined to Russia in 2014 in the course of conflict with the Ukraine), it is precisely the area which is the least populated region: as of 1 January 2017 its population numbered less than 49,900 (Source: Rosstat, *Chislennost nalseleniya v Rossiskoi Federatsii po munitsipalnam obrazovaniem*, 2017).

The Chukotka Autonomous Okrug is known as a region with extremely severe climatic conditions — winter there lasts for ten months a year. The average January temperature fluctuates from −15 to −39 °C and in July — from +5 to +10 °C. On 10 December 1930, the Chukotka Autonomous Okrug was formed as part of the adjacent Magadan Oblast. Gold, tungsten and other non-ferrous metals are produced on the Chukotka, as well as oil and gas, but the main population inflow came either from prisoners or, particularly during the cold war period, military personnel from military bases (Alayev et al., 2001; Sevruka, 2006).

In 1939, nearly a decade after the creation of the Okrug, the official population of Chukotka exceeded 21,000 people. Military personnel on military bases and workers of the enterprises essentially increased the number of residents at this territory. After the war, the population rose further, exceeding 46,000 people by 1959 and in 1989, according to the last population census in the Soviet Union, exceeding 160,000 people (Fig. 2).

During the early Soviet period the major population of the Okrug were Chukchi and other northerners (Table 1), as clearly exemplified by the fact that a very small number of population in 1939 were presented by town dwellers (Fig. 2). Nevertheless, already in 1959, the town community prevailed and the majority of the population became Russian (Fig. 2, Table 1). Apparently, the inflow of migrants from other regions was considerable. People from the European part of Russia started arriving in Chukotka to construct prisons, resource-producing enterprises, military bases and other facilities, whereupon the national composition started replenishing itself with Russians, Ukrainians and other representatives of union republics.

As already observed above, following the demise of the Soviet Union out of Far Eastern regions, a large-scale exodus of migrants got underway. But even with this general exodus in mind, the population of the Chukotka Autonomous Okrug, exceeding 160,000 people during the last year of existence of the Soviet Union, declined dramatically in just over 20 years — by nearly 50,000, i.e. a fraction of more than a third. These indicators may be seen in Table 1 and Fig. 2 and one of the primary causes is apparently the outmigration. A graph showing the intensity of this outflow is included in Fig. 3. As can be seen, after the demise of the Soviet Union, the inflow of population to Chukotka sharply changed to an outflow of migrants from the place. The actual status of Chukotka as an internal colony was also specified by the fact that these migration flows coupled most strongly and specifically with the Central Federal Okrug and primarily with Moscow (Fig. 4). The same migration interaction may be observed, for example, between the northernmost region of Japan — the island of Hokkaido — and Tokyo. The population migration in this area, Hokkaido, the most distant from the center prefecture, is mainly oriented not with the neighboring regions, but primarily with Tokyo, the capital of Japan (see: Statistical Service of the Ministry of Internal Affairs Japan, *“Report on Internal Migration in Japan based on house registers of residents“,* 2012).

The above-mentioned data clearly shows that the development of Chukotka was directly associated with the regional policy of the central

[1] For example, see Zakon RF o gosudarstvennykh garantiyakh i kompensatsiyakh dlya lits, rabotayushchikh i prozhivayushchikh v rayonakh Kraynego Severa i priravnennykh k nim mestnostyakh (V redaktsii Zakona Rossiyskoy Federatsii ot 02.06.93 g. N 5082-I; Ukaza Prezidenta Rossiyskoy Federatsii ot 24.12.93 g. N 2288; federal'nykh zakonov ot 08.01.98 g. N 4-FZ) [The Law of the Russian Federation on State Guarantees and Compensations for Persons Working and Living in the Extreme North and Equivalent Territories (As amended by the Law of the Russian Federation No. 5082-I of 02.06.93; Decree of the President of the Russian Federation of December 24, 1993, N 2288, federal laws of 08.01.98, No. 4-FZ)].

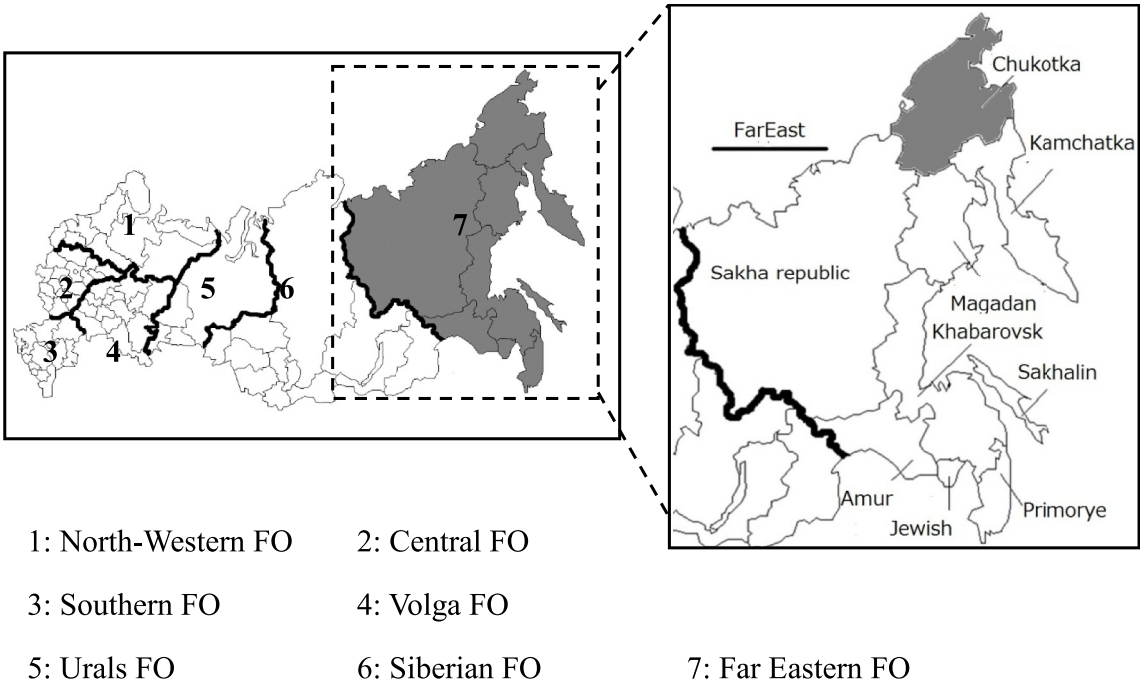

Fig. 1. Federal Okrugs (FO) of Russia; Far Eastern region; The Chukotka Autonomous Okrug.
Source: Prepared by the authors

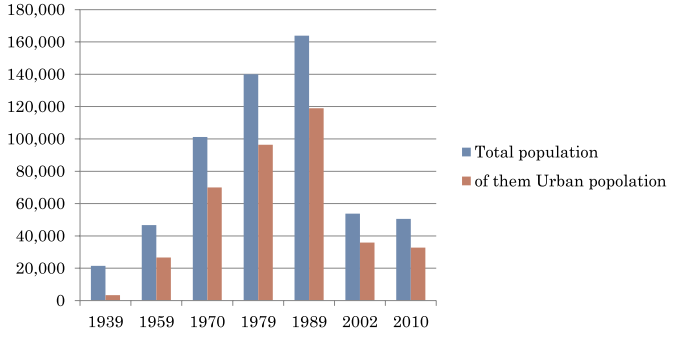

Fig. 2. Population change in Chukotka since 1939 to 2010 (people).
Source: Prepared by the authors by results of population census

Table 1
Ethnic composition of population of Chukotka Autonomous Okrug.
Source: Prepared by the authors by results of population census.

	1939	1959	1970	1979	1989	2002	2010
Chukchi	12,111	9975	11,001	11,292	11,914	12,622	12,772
Chuvash					944	951	897
Yupik	800	1064	1149	1278	1452	1534	1529
Even	817	820	1061	969	1336	1407	1392
Russian	5183	28,318	70,531	96,424	108,297	27,918	25,068
Ukraine	571	3543	10,393	20,122	27,600	4960	2869
Others	2055	2969	7049	9859	12,391	4432	2961
All	21,537	46,689	101,194	139,944	163,934	53,824	50,526

Note: 2770 people did not declare an ethnicity. The proportion of ethnicities in this group is assumed to be the same as that of the declared group.

government of the Soviet Union. The results of such development policy can be observed more clearly if seen from the demographic situation of the region. In the next section, the authors examines the population dynamics inside Chukotka by its region as well as the situations characterizing these areas.

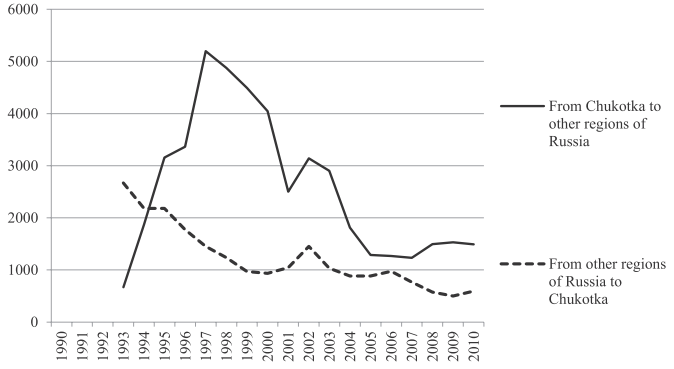

Fig. 3. Population Migration to and from Chukotka (in person).
Sources: Prepared by the authors by internal materials of Rosstat. Since 2011 the definition of population migration changed and the data after this is not comparable with those up to 2010, therefore this diagram ended in 2010.

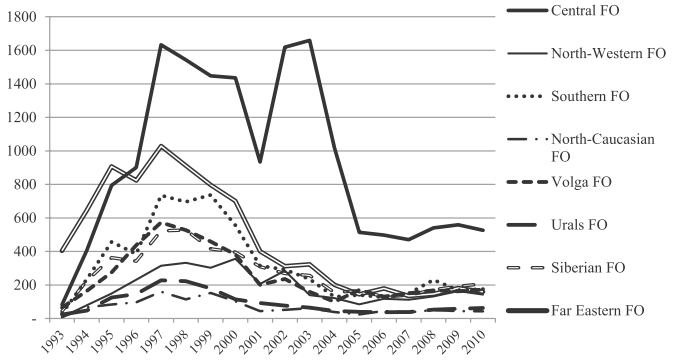

Fig. 4. Population Out-Migration from Chukotka by Destination. (in person).
Sources: Prepared by the authors by internal materials of Rosstat. Since 2011 the definition of population migration changed and the data after this is not comparable with those up to 2010, therefore this diagram ended in 2010.

Fig. 5. Municipal districts and main settlements of the Chukotka Autonomous Okrug as of 1 January 1992.
Source: prepared by the authors

4. Population of municipal districts and abandoned settlements of Chukotka

As has been noted above, the huge territory of the Chukotka Autonomous Okrug is scarcely populated and its population density is very low. In cases of depopulation, many cities and urban-type settlements (*poselok gorodskogo tipa*) become totally abandoned and this is a growing region-wide trend. Let the authors consider this situation with the specific examples presented below.

4.1. Population of municipal districts

Fig. 5 presents a map of the districts and main settlements of the Chukotka Autonomous Okrug. Prior to 2011 Chukotka was divided into eight municipal districts, but this division was revised in 2012 and now comprises six municipal districts (*munitsipal'NOE obrazovanie*) plus one city. The names of these districts are enclosed in rectangular boxes on the map.

The capital city of Chukotka, Anadyr, is classified as a separate administrative unit, together with the six municipal districts. The chief facilities units for consideration here are the township on the map without boxes; in both Russia and the former USSR they were called “industrial communities” (*rabochiy posolok*) or “urban-type settlements“. This status is received by the settlements, where over 85% of the population is persons not dealing with agriculture, and the population exceeds 3000. Fig. 5 shows all cities and “industrial communities“(or townships) as of 1 January 1992.

19 cities and urban-type settlements are shown here altogether. The fact that there were comparatively many cities in spite of its low population of 160,000 in the area is low population for the Okrug may be explained by the policy that due to considerations of national defense as well as the strategy of developing dispersed natural resources, more dense population of the territory was avoided as a matter of principle (Hill and Gaddy, 2003). Nevertheless, this resulted in the existence of comparatively many urban settlements with small population.

Following the decay of the USSR, mass depopulation started and it became physically impossible to support the settlements with inefficient industries in Chukotka. Consequently, the towns and settlements which were already built up started to be devastated and abandoned with ever increasing frequency.

To more vividly understand the demographic trends in districts and settlements of the post-Soviet Chukotka, Fig. 6 and Fig. 7 shows changes in township status and the trends in population location by district. As can be seen, the sharp reduction in population is observed since 1991, directly after the decay of the Soviet Union and continued up to the beginning of 2000s. In the course of this process, many of settlements, initially with few residents disappeared by the end of the 1990s.

The statistical data specified in Fig. 7 may not coincide with reality, since the legal township status may, in fact, not be connected directly with the existence or non-existence of enough population for getting that status. The loss of the township status and official closing down of the settlement, as a rule, happens several years after the number of residents goes below the threshold size. There are cases of settlements whose population decreased to, say, 10 or 100 residents before the loss of the township status, and only after a certain period has passed the settlement loses its township status and is officially treated as “abandoned”. Below the authors briefly overviews examples of the Chukotka settlements having lost their township status and been officially abandoned.

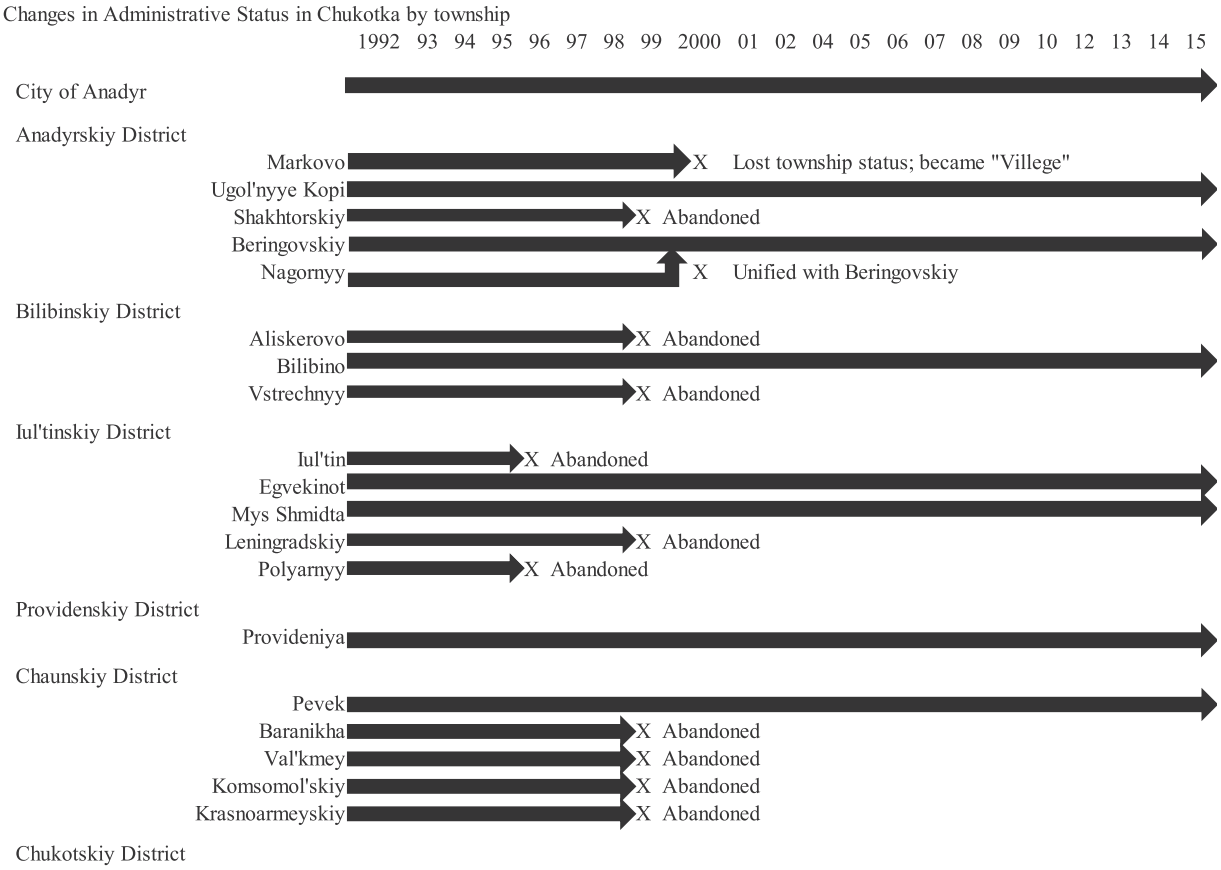

Fig. 6. Changes in township status in Chukotka.
Source: Prepared by the authors by various materials (law and other documents).

4.2. Abandoned urban-type settlements of Chukotka

4.2.1. Iul'tin

In 1937 a large tin and tungsten deposit was found in the Iul'tin district, extraction of which started in 1959 (Karakovskiy, 2008). The mine and ore mining and processing industrial complex were linked by road with the Egvekinot settlement, which was built using prisoners on the coast of the Bering Sea. The Iult'in mine was a core in the economy of the Chukotka Autonomous Okrug and during the Soviet period, commercial ships loaded with Iul'tin tin and tungsten gathered way from the Egvekinot port (Thompson, 2008).

Nevertheless, after the demise of the Soviet Union the situation worsened sharply. The expensive extraction of row metals under the conditions of the Extreme North, with its underdeveloped transport infrastructure and within the framework of the Soviet economic planning system, was deemed unprofitable and irrational.[2] In 1995 the settlement was abolished by government order[3] and despite its population still exceeding 5000 as late as 1989, nothing was left there.

With the decree of the government on the closure of the settlement, the government purchases the apartments or houses of the inhabitants, maximum of 15 sq. m. for each person at the price of 250 thousand rubles in 1994 prices with certain indexation. Transportation costs for luggage at the maximum of 1 ton for each person are born by the government as well. The procedure for payment of above compensations was assumed to be determined within the period of one month. The Ministry of the Russian Federation for Nationalities and Regional Administration of the Chukotka provide the assistance for the residents of the settlement of Iul'tin in search of new places of residence and work. The same kind of scheme was applied in other settlements as well.

4.2.2. Polyarnyy

The settlement of Polyarnyy is also situated in the Iul'tin district, on the Arctic coast of the Chukchi Sea, within the Arctic Circle. The main development of mineral resources started in 1962 when the Polyarnyy ore mining and processing industrial complex — the largest gold producing center in the North-Eastern region of Russia — was built to enrich the country with 300–400 kg of gold annually (Redkiy, 2014).

[2] We obtained information on unprofitability of the companies from the survey conducted in Chukotka, but detailed documents on financial situations of each company were not provided, although the governmental decrees on the closure of small settlements in Chukotka clearly declared unprofitability of mining industries in the territory. However, there are very clear supporting evidences. Although the economic branch was not identified in the early transition period, the percentage share of unprofitable enterprises of the whole regional economy in Chukotka was the highest among all the regions in 1992 and 1993. The percentage share of unprofitable enterprises by branch of the economy shows that the share of unprofitable companies in Chukotka in the sphere of industry and mining occupied the places among all the Russian regions as follows: 4th in 1994; 3rd in 1995; 3rd in 1996; 1st in 1997, 1998 and 1999. (Rosstat, *Regiony Rossii* [Regions of Russia], 1998 and 2000, Moscow.)

[3] Postanovleniye Pravitel'stva RF ot 4 dekabrya 1995 g. N 1188 ″O merakh po stabilizatsii sotsial'no-ekonomicheskoy obstanovki v Chukotskom avtonomnom okruge i sotsial'noy zashchite naseleniya poselka Iul'tin" [Decree of the Government of the Russian Federation of December 4, 1995 N 1188 ″On measures to stabilize the socio-economic situation in the Chukotka Autonomous Okrug and the social protection of the population of the village of Iul'tin"].

Population by City, Rayon and Urban Type Settlement in Chukotka
(The figures in 2004 and 2012 are modified based on Population Census conducted in 2002 and 2010.)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006	2007	2008	2009	2010	2012	2013	2014	2015	2016	2017
Chukotka, in total	145700	130700	119500	106100	96900	91800	87300	83100	78600	75300	73800	51400	50707	50526	50484	50263	49520	48591	50988	50780	50555	50540	50157	49822
City of Anadyr	16500	15200	14100	14100	13900	13600	13200	13000	12600	12000	12000	10900	10892	11193	11511	11819	11827	11777	13529	13747	14029	14326	14899	15468
Anadyrskiy District =>Anadyrskiy munitsipal'nyy rayon	30300	27200	26300	23300	21900	21100	20100	28900	17900	17100	16600	10300	9940	9779	9625	9462	9299	9048	9206	9083	8835	8788	8571	8288
Of them																								
Markovo	2100	2300	2300	1900	1800	1700	1600	1500	1500	1400	1400	1300	3600	3511	3449	3457	3406	3395	3367	3487	3574	3586	3666	3736	3718
Ugol'nyye Kopi	11300	1800	1800	2100	1900	1800	1500	1500	1400	1400	1300	100	61	46	31	15 X								
		10100	9500	1600	1500							1800	1713	1676	1631	1577	1504							
				8800	8500	1400	1300																	
						8300	8000																	
								1300 X																
								7600																
									7300	7100	7000													
Shakhtorskiy	2600																							
	2800	2400	2200																					
Beringovskiy	4000	3500	3500	3200	2800	2600	2600	1200	3100	2900	2800													
Nagornyy								2400 X											1408	1223	1102	1003	983	837	755
Bilinibskiy District =>Bilinibskiy munitsipal'nyy rayon	25900	23700	20800	18000	16400	15500	14800	14300	13700	13400	13300	8500	8395	8257	8215	8131	7922	7696	7801	7738	7855	7825	7609	7464
Of them																								
Aliskerovo	1100											0	4	3	3	3 X								
Bilibino	15200	1000																						
		13900	900																					
			12100	700																				
				10700	600	500																		
					9900	9600	500	500																
							9200	8800	600	500	500													
									8300	8100	8000													
												5900	5823	5717	5693	5640	5453	5277	5486	5451	5588	5592	5453	5348
Vstrechnyy	1300	1200	1000	800	700	600	600	600	500	600	600	0	4	-	-	- X								

(Caption on next page)

Fig. 7. Population change in Chukotka by district, town and settlement.
Note: Population in the City of Anadyr slightly increased after 2010. Interregional migration may affect, but the change in the definition of population migration could affect this. Overall scale of interregional migration flows, regardless of regions, increased suddenly since 2011, but the data from 2011 and after is not comparable with those up to 2010.
Population change in Chukotka by district, town and settlement.
Source: Rosstat, *Chislennost' naseleniya v Rossiyskoy Federatsii po munitsipal'nym obrazovaniyem* [Population in the Russian Federation by Municipality], Moscow, 2015.

In 1992, the Polyarnyy ore mining and processing industrial complex was privatized.[4] Initially, there were plans to modernize the plant by introducing new extraction technologies (Mikhaylov, 2008), but the market economy meant gold mining in Polyarnyy became unprofitable and support for it was considered unfeasible. Although about 4000 people lived here in the in 1980s, after the ore mining complex closed, the settlement was abandoned by its residents and in 1995 the settlement was officially abolished.[5]

4.2.3. Val'kumey

The settlement in the Chaunskiy district is situated on the Pevek peninsula at the East Siberian Sea (The Arctic Ocean). It was also established as a center for developing a tin producing mining facility (Karakovskiy, 2008). It was built in 1941 using prisoners.

The tin mine of Val'kumey, the development of which was performed at the almost same time with development of the Iul'tin settlement and Pevek settlement (center of the Pevek district). Val'kumey was also one of the industrial centers of Chukotka. During the Soviet period, although nearly 4000 people lived there, based on the market economy, tin extraction was deemed unprofitable and the settlement was also officially abolished in1998[6] (Karakovskiy, 2008).

4.2.4. Baranikha

Like Val'kumey the settlement of Baranikha is situated in the Chaunskiy district, on the shore of the East Siberian Sea. It was founded in 1960 at a gold mine; the development of which was actively pursued by the Communist Party of the USSR. In 1968 its population numbered 3100 people and even an airport was built nearby (Karakovskiy, 2008). However, under the market economy, further development of mines was deemed unprofitable and like many other industrial centers of the region, this settlement was officially abolished in1998.[7]

4.2.5. Other abandoned settlements (Komsomol'skiy, Krasnoarmeyskiy, Leningradskiy, Vstrechnyy, and Shakhtorskiy)

In 1998, when government resolutions[8] abolished the settlements of Baranikha and Val'kumey, many other Chukotka settlements were also officially closed. In the Chaunskiy district, settlements of Komsomol'skiy and Krasnoarmeyskiy were closed down; in the Iul'tin district — the settlement of Leningradskiy; in the Bilibinskiy district — Aliskerovo and Vstrechnyy and in the Anadyrskiy district — Shakhtorskiy.

Gold mining started in Komsomol'skiy in 1957 and in Aliskerovo in 1961. The settlements of Leningradskiy, Vstrechnyy and Krasnoarmeyskiy were also constructed for the sake of gold mining (Karakovskiy, 2008). An exclusion from this row represents the settlement of Shakhtorskiy with its main enterprise – a fish processing plant. Prior to closing down this settlement, all its inhabitants were moved to nearby settlements, mainly to the military base Goodym and Ugol'nyye Kopi (Karakovskiy, 2008).

5. Interpretation

In the previous sections the authors viewed that many of the settlements having town status as of 1 January 1992 today turned out to be abandoned. With this in mind, all the settlements mentioned were officially abolished no later than 1998. Thus, of 19 earlier existing settlements (including the settlement of Nagornyy, which merged with the neighboring Ugol'nyye Kopi, and the Markovo settlement, which changed its status from that of an “urban-type settlement” to a “rural settlement”), ten settlements were liquidated; two more following a merger formed one settlement and only 7[9] settlements remained unchanged. In other words, as was shown in Fig. 8, of all the urban-type settlements in the Chukotka Autonomous Okrug, half of them “died”.

At the same time, all cases of liquidation of “died-out” settlements are united by several common factors. First of all, each was created based on mining enterprises for the extraction of gold, tin, tungsten, etc. and each also had weak transportation infrastructure. What should be noted is that Chukotka lacks the railway equipment at all, and another point to be noted is, needless to say, the region's remote location from a large market and all-time accessible transport facilities (ice-free ports). Finally also, after the demise of the Soviet Union none could withstand the real expenses required to remain as a going concern, incurred due to the severe conditions of the Extreme North. In reality, as can be seen in Fig. 8, all abandoned settlements are situated far to the North of the Arctic Circle boundary with the exit to the East Siberian Sea, while all remaining settlements are concentrated directly in the vicinity of the district centers, and the settlements facing with the Bering Sea in the south remain.

Besides, it should also be noted that all liquidations of settlements occurred before the year 2000, whereupon no further cases of abolishment or change of settlement status were observed. Such change of situation was stood out in terms of the population change, as shown in Fig. 7. In reality, at the beginning of the 2000s, although the total

[4] Rasporyazheniye Pravitel'stva RF ot 29 oktyabrya 1992 g. N 2001-r O privatizatsii Polyarninskogo gorno-obogatitel'nogo kombinata > [Order of the Government of the Russian Federation of October 29, 1992 N 2001-r On the privatization of the Polar Mining Ore Combine >].

[5] Postanovleniye Pravitel'stva RF ot 24 maya 1995 g. N 518 «O merakh sotsial'noy zashchity naseleniya poselka Polyarnyy Shmidtovskogo rayona Chukotskogo avtonomnogo okruga, svyazannoy s likvidatsiyey poselka i perekhodom Polyarninskogo gorno-obogatitel'nogo kombinata na novuyu tekhnologiyu dobychi zolota» [Decree of the Government of the Russian Federation of May 24, 1995 N 518 ″On the measures of social protection of the population of Polarny village of Shmidtovsky district of the Chukotka Autonomous Okrug, connected with the liquidation of the village and the transition of the Polyarny Mining and Processing Combine to a new gold mining technology"].

[6] Postanovleniye Pravitel'stva RF ot 2 fevralya 1998 g. N 128 ″O merakh sotsial'noy zashchity naseleniya likvidiruyemykh poselkov zolotodobytchikov v Chukotskom avtonomnom okruge" [Decree of the Government of the Russian Federation of February 2, 1998 N 128 ″On the measures of social protection of the population of the liquidated settlements of gold miners in the Chukotka Autonomous Okrug."].

[7] See footnote iv.

[8] See footnote iv.

[9] In the research of T. Litvinenko (2013) and others (Litvinenko and Kumo, 2017), as many as 38 such abandoned settlements were found all over Chukotka, which differs from the description in this paper. The fact is that this work considers the facilities with a town-like status as of the beginning of 1992, while the data of T. Litvinenko (Litvinenko, 2013; Litvinenko and Kumo, 2017) included settlements with a smaller status as a “small settlements related to mining”. Technically, the authors cannot take into account such data; moreover, according to Litvinenko's words, her data were presented to her by a third person and she had no ability to recheck the information. Nevertheless, taking into consideration that only one third of the Chukotka Autonomous Okrug population remained, her description seems quite true as well.

Fig. 7. (*continued*)

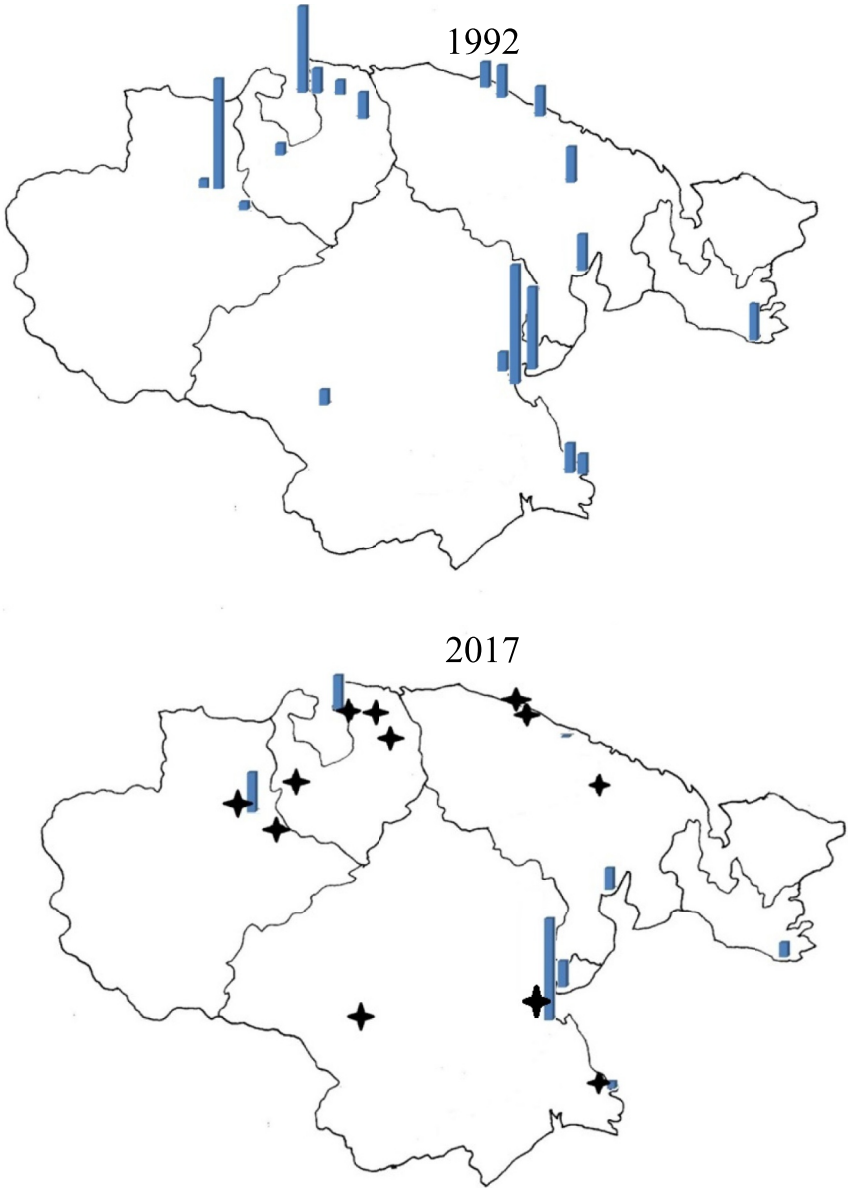

Fig. 8. Abandoned and remaining city/urban-type settlements of Chukotka.
Source: Prepared by the authors based on the database of the RF information-legal portal "Garant" and other materials.(✦ - Abandoned urban-type settlements; ▮ - Remaining urban-type settlements and a city. The scale means the size of population and they are comparable either in 1994 or in 2017.)

population of Chukotka declined drastically, it then stayed more or less unchanged at a later stage. Since the moment of the population census of 1989 to the next in 2002, the Okrug population declined by more than 110,000 people, but since 2002 to 2010 – the reduction comprised only three thousand people (Table 1).

These figures clearly show that the demographic situation in Chukotka has stabilized. In 1997, already after the demise of the Soviet Union, a "Northern Restructuring Program" was proposed for the movement of people from within the Arctic Circle and neighboring areas. In accordance with this program, the intention was to select several towns; the inhabitants of which would be moved to neighboring comparatively large settlements gradually, allowing the former towns to be liquidated from a long-term perspective. The initial experiment conducted for the second in size town of the Magadan Oblast — Susuman (directly to the west of Chukotka), was quite a success: as noted by many observers in their reports, the population of the town where the social base requires extremely expensive maintenance was considerably reduced (World Bank, 2005; Thompson, 2004). The program had the following logic to follow, whereby both the territory with a population of one million people and that with only 100 people required a necessary minimum of living infrastructure. Nevertheless, any already built infrastructure will incur ongoing further maintenance expenses. Accordingly, if people are moved from thinly populated towns to more densely populated areas and the desolate towns are abolished, the state as a whole can obtain great economic gain. In light of a case of Chukotka, this kind of a strategy of selection and concentration must give positive effects on more efficient locational choices.

The then-governor Mr. Roman Abramovich and local government officials of the Chukotka Autonomous Okrug repeatedly announced that an optimum population size for the Okrug would be 30,000–35,000 people based on a comparison of the local cost of living, or the cost to the state of supporting a northern resident, under the present and anticipated levels of federal subsidies and local tax revenues (Thompson, 2002, 2004), and Mr. Abramovich himself set out how to reduce the population in the region[10]. There is no doubt that the government of the USSR performed its expansionist regional policy foe developing the Chukotka, and this resulted in population exodus directly after the

[10] https://lenta.ru/news/2004/04/08/chukotka/.

demise of the Soviet Union. Nevertheless, today in 2015, quarter of a century after the fall of the Soviet Union, one can observe that the population of the region for the last decade has remained stable; at 50,000 rather than 30,000 people. Considering this situation, it is possible to say that rational population size is already realized.

In the great scheme of things, it is useless and hopeless to create an industrial base in the conditions of Extreme North. If seen from the market perspective, even the population of the Far East (6.2 million people or 4.4%) comprises less than 5% of the whole population of Russia (144 million people). Then the market size of the North end of the region, the Extreme North, is apparently limited. In reality, additionally, compared to South-East Asian countries, even the Russian Far East has a very small pool of labor resources with a high level of wages. And what is worse, Chukotka has the territory almost twice as large as that of Japan, but the size of its population is less than 0.04% of that in Japan. Although Chukotka is involved in the Russian governmental program called “Social and economic development of the Far East and the Baikal region",[11] there must be many problems to be solved even for issues related to development of natural resources. Lack of transportation facilities, sever climate conditions, lack of labor power can be listed, among others. As is shown by the experience of Chukotka, even when the region tries to excavate wealthy natural resources, almost everything is hindered due to the lack of developed infrastructure and isolated location.

The period of sharp crisis following the economic transition has ended. Even so, it seems that any attempt to reverse migration flows, increase the number of inhabitants and establish a production base in the Russia Far East or the Extreme North is likely to fail, even under the current governmental program. This is reminiscent of the policy of developing remote regions as practiced in Soviet times. As accentuated by Hill and Gaddy (2003), the burden of sustaining the social base of remote regions was an eternal “curse” of the former Soviet Union. Today's Chukotka is an outstanding example of how to overcome this “curse” and solve the dire problems realistically. The experience of Chukotka is an excellent example for interpreting the errors made by the governmental policy for resource distribution and its development priority.

Acknowledgements

This research is financially supported by the Grant-in-Aid for Scientific Research (A) (26245034) by the Japanese Ministry of Education, Science, Culture and Sports (K. Kumo), and Japan Securities Scholarship Foundation (K. Kumo). The research was also supported by the fundamental research project "Shifts in the territorial organization of society in the transition to the post-industrial stage of development" (Russia's governmental contract No. 01201352495) (T.V. Litvinenko).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.polar.2018.11.002.

[11] Postanovleniye Pravitel'stva ot 15 aprelya 2014 goda №308. Deystvuyushchaya redaktsiya gosprogrammy « Sotsial'no-ekonomicheskoye razvitiye Dal'nego Vostoka i Baykal'skogo regiona». [The Government Resolution dated April 15, 2014 No. 308. The current version of the state program "Socio-economic development of the Far East and the Baikal region."].

References

Alayev, E.B., S Gracheva, T., Kachalova, Ye SH., 2001. In: Entsiklopediya SNG: Regiony Rossii [Encyclopedia of the CIS: Regions of Russia. Zheldorizdat, Moscow (in Russian).
Andrienko, Y., Guriev, S., 2002. Determinants of Interregional Mobility in Russia: Evidence from Panel Data, CEFIR Working Paper No.10, February 2002.
Dudaev, A.A., Chupakhin, V.S., Oland, J., 2013. Health and society in Chukotka: an overview. Int. J. Circumpolar Health. https://doi.org/10.3402/ijch.v72i0.20469.
Duerden, F., 1992. A critical look at sustainable development in the canadian North. Arctic 45 (3), 219–225.
Heleniak, Timothy, 1999. Out-migration and depopulation of the Russian North during the 1990s. Post Sov. Geogr. Econ. 40 (No.3), 155–205.
Hill, F., Gaddy, C.G., 2003. Siberian Curse: How Communist Planners Left Russia Out in the Cold. Brookings Institution Press.
Karabchuk, T., Kumo, K., Selezneva, E., 2017. Demography of Russia: from the Past to the Present. Palgrave Macmillan, London.
Karakovskiy, A., 2008. Ischeznuvshiye goroda [vanished cities]. accessed on May 4, 2017) (in Russian). http://www.dead-cities.ru/.
Kumo, K., 1997. Economic system conversion and migration transition in Russia. Rev. Urban Reg. Dev. Stud. 9 (2), 20–37.
Kumo, K., 2003. Migration and Regional Development in the Soviet Union and Russia: a Geographical Approach Beck Publishers Russia, Moscow 2003.
Kumo, K., 2007. Interregional migration in Russia: using an origin-to-destination matrix. Post Commun. Econ. 19 (2), 131–152 2007.
Kumo, K., 2017. Interregional migration: analysis of origin-to-destination matrix. In: Karabchuk, T., Kumo, K., Selezneva, E. (Eds.), Demography of Russia: from the Past to the Present. Palgrave Macmillan, London, pp. 261–314.
Litvinenko, T., 2013. Postsovetskaya transformatsiya resursopol’zovaniya i yeye vliyaniye na dinamiku naseleniya v Chukotskom avtonomnom okruge [Post-Soviet transformation of resource use and its impact on population dynamics in the Chukotka Autonomous District], *izvestiya RAN*. seriya geograficheskaya No.2, 30–42 (in Russian).
Litvinenko, T., Kumo, K., 2017. Post-Soviet period changes in resource utilization and their impact on population dynamics in Chukotka Autonomous Okrug. Geogr. Environ. Sustain. 10 (No.3), 542–565.
Mikhaylov, P., 2008. Vo Glubine Chukotskikh Rud [In the Depths of Chukchi Ores] No.52 Ogonok (in Russian).
Motrich, YeL., 2006. Neseleniye Dal’nego Vostoka Rossii [Population of the Far East of Russia. DVO RAN, Vladivostok-Khabarovsk (in Russian).
Petrov, A., 2010. Post-staple bust: modeling economic effects of mine closures and post-mine demographic shifts in an arctic economy (Yukon). Polar Geogr. 33 (No. 1–2), 39–61 March-June 2010.
Redkiy, V., 2014. URBAN 3P Project. Web-article. http://urban3p.ru/, Accessed date: 4 May 2017.
Sevruka, M.A. (Ed.), 2006. Rossiya - Federal'nyye Okruga I Region [Russia: Federal Districts and Regions. Mezhdunarodnyy universitet < Sodruzhestzho > , Moscow (in Russian).
Thompson, N., 2002. Administrative resettlement and the pursuit of economic: the case of Chukotka. Polar Geogr. 26 (4), 270–288.
Thompson, N., 2004. Migration and resettlement in Chukotka: a research note. Eurasian Geogr. Econ. 45 (1), 73–81.
Thompson, N., 2008. Settlers on the Edge: Identity and Modernization on Russia's Arctic Frontier. UBC Press.
Vorob'yev, V.V., 1977. Naselenie Vostochnoi Sibiri. Nauka, Moscow (in Russian).
World Bank, 2005. From Transition to Development: a Country Economic Memorandum for the Russian Federation. the World Bank, Moscow.