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Demographic Limitations of Reclamation and Development of the Arctic Areas of the Far East of Russia

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Abstract--- *The present research analyzes demographic processes in a geopolitically and economically important region – Chukotka Autonomous Okrug (ChAO) located on the northeastern borders of Russia and fully included in its Arctic zone. The long-term demographic processes (from 1939 to the present) are regarded, and the main factors that determine their focus and scope are identified. The authors note that demographic processes here occurred with different intensity and identify sometimes-multidirectional stages in settlement and economic development, according to these criteria. A significant dependence of migration growth on the creation of large extractive industries in the region determined the level of economic well-being of the population and the region as a whole. The research substantiates that the resulting outflow of the population is also associated with the 'curtailment' of extractive industries in 1985-1989 in connection with the 'perestroika' reforms. The dynamics of natural population growth over the entire analyzed period is also largely 'linked' to periods of active development of mineral resources and 'perestroika' reforms. Such features (which closely correlate with highly efficient extractive industries) of the demographic potential formation in the considered region and in the Northeast of Russia as a whole should be taken into account when designing socio-economic development programs and concepts of demographic policy. The present study statistically analyzes and estimates the structure of migration flows, causes of death, life expectancy, etc. which also affect the demographic situation in the region. Measures are suggested to maintain demographic growth in the face of declining birthrate reserves, aging populations, maintaining migration outflows, losses of the able-bodied population to external causes of death, etc.*

Keywords--- *Arctic Zone, Chukotka Autonomous Okrug (ChAO), Demographic Potential, Migration, Natural Population Growth, Structure of Migration Flows.*

I. INTRODUCTION

In the context of rapidly growing geopolitical and economic value of the Arctic zone for Russia, strengthening its demographic potential becomes crucial. For the Far Eastern sector of the Arctic zone, this is especially important both for ensuring the national security of the country at the strategic northeastern borders, and for developing the economy of the region rich in natural resources. The need to overcome negative demographic trends in this vast territory is also noted in the "Strategy for the Development of the Arctic Zone" [30]. According to the document, the positive changes in the demographic situation here must be based on the natural population growth provided by a decrease in mortality and an increase in the birth rate. Other decisions were made to improve the demographic

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situation (in the country as a whole, in the Far East and in its Arctic zone), yet they failed to prove their efficiency. It can be assumed that the measures taken do not adequately solve the problems accumulated in this area; these problems are not only due to the lack of financial resources in the country but also to the lack of understanding their depth.

In this regard, the analysis of the demographic situation in the Northeast is highly relevant today. Along with the geopolitical prerequisites for updating such studies, it is also important from the standpoint of developing mineral resources (primarily precious, non-ferrous and rare earth metals, oil and gas raw materials, diamonds) in the northern regions which occupy leading positions in the country in terms of resource availability. Moreover, such studies are also relevant for ensuring the stable functioning of the Northern Sea Route which is gaining international significance today due to the global warming and the globalization of international trade, especially the intensification of the Eurasian 'economic poles' – Western Europe and China [1, 3].

Numerous works are devoted to the demographic problems of the northern (including the Arctic) territories: S.A. Sukneva (31), V.V. Fauzer (36), V.G. Loginov (12), D.Yu. Rudenko (20), A.L. Sinitsa (26), L.A. Popova (16), T.S. Mostakhova (13), A.V. Ukhanova, E.V. Smirennikov, L.V. Voronina (35) et al. Much fewer studies were made of the demographic development of Chukotka Autonomous Okrug and its municipalities. The demographic processes of the European North, the Republic of Sakha (Yakutia) are examined in more detail. In ChAO, the influence of resource use transformation on population dynamics was examined [10, 11].

The study aimed to assess the true demographic situation in the Northeast of Russia (on the example of ChAO), to analyze the factors determining the demographic potential in this highly specific region; these factors are to be taken into account in regional socio-economic programs of its development and in the concept of demographic policy.

II. Materials And Methods

The research methodological toolkit is an analysis of statistical data that allows assessing the true demographic situation in ChAO – a sparsely populated region with an area approximately twice as large as Germany or Japan, yet with only about 50 thousand people (or 0.6% population of the Far Eastern Federal District).

The study uses representative data of annual statistical collections: 'Statistical Yearbook of Chukotka' published by the Territorial Authority of the Federal State Statistics Service for ChAO; 'Demographic Yearbook of Russia'; and 'Regions of Russia. Socio-economic indicators'. These sources contain statistical data on the demographic and socio-economic situation of the constituent entities of the Russian Federation, which makes it possible to conduct a comparative analysis of the studied region and other regions.

Population dynamics is the resulting indicator of the demographic development of the territory for the corresponding period. When analyzing population changes during the period under review, the authors used statistical methods characterizing the urban and rural population, and considered the sources of these changes (due to natural increase or decrease, to migration increase or outflow). For a component analysis of population changes, the authors used data from natural movement (indicators of fertility, mortality, and natural growth), their ratio and

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dynamics. Another component of demographic development – the migration movement – affects the demographic development through the influx or outflow of the population to/from municipalities, changing the structure of the flow and migration mobility. The population age structure was analyzed according to the All-Russian population censuses of 1989, 2002, 2010 and to current statistical information. The dynamics of this indicator reflects the state of the reproduction process and its trends during the period under review, and can be used in the development of socio-demographic forecasts.

III. RESULTS AND DISCUSSION

The positive regional factors of population reproduction in ChAO include the positive dynamics of natural population growth. Based on the analysis of regional factors of reproduction and migration processes, the following demographic restrictions can be identified as the main ones: the need to maintain demographic growth in the face of a decrease in fertility reserves, a decrease in the active reproductive contingent, aging population; the increase in the number of people over working age (representing a challenge for further economic development); migration outflow in the formation of the population of ChAO; high losses of the working population to external causes of death; low level of life expectancy despite the positive dynamics of recent years; and territorial differentiation in the population reproduction. The results can be employed by local executive bodies for designing strategic documents of the socio-economic development of the okrug and of regional demographic policy measures.

Chukotka Autonomous Okrug is the only one of the four autonomous regions of Russia that is not part of another constituent entity of the Russian Federation. A significant part of the territory lies beyond the Arctic Circle, resulting in extreme climatic conditions. The population density in the Russian North determines the economic opportunities for territorial development. ChAO has the lowest population density in the Russian Federation – 0.07 people/km^2.

According to a number of socio-economic indicators, ChAO differs from the average Russian and Far Eastern levels. For example, the average cash income per capita in 2017 amounted to 70,904 rubles, which is 2.3 times higher than the average level of the Russian Federation (according to this indicator, ChAO ranks 2nd in the country after the Yamalo-Nenets Autonomous Okrug); the registered unemployment rate (2.2%) exceeds the Far East (1.4%) and the average level (1.0%); housing is 24.1m^2 per resident, while the average figure is 25.2 m^2, and in the Far Eastern Federal District it is 23.7 m^2. The incidence of the population in ChAO is 1.7 times higher (1342.9 per 1000 people in 2017) than the average level (778.9 per 1000 people). The healthcare services rate in ChAO per 10,000 people is high: the number of hospital beds is 133.1, and ChAO ranks 1st in the Russian Federation for this indicator (the average level is 80.5, the Far Eastern Federal District level is 99.6). The capacity of outpatient organizations is 507.6 – the highest indicator in the Far Eastern Federal District and 1.9 times higher than the average; the okrug ranks 2nd in the number of doctors in the Russian Federation, after St. Petersburg – 74.8 (the highest indicator in the Far Eastern Federal District) [19]. However, healthcare facilities are located in cities (there are three of them in ChAO – Anadyr, Bilibino, Pevek) and okrug centers, which, in conditions of low density and lack of roads, significantly limits the availability of medical care for the residents.

The demographic feature of the okrug is determined by the small population and extremely uneven distribution on a vast territory (721.5 thousand km^2), which is 10.4% of the total area of the Far Eastern Federal District, due to

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the development and settlement processes. ChAo ranks 1st among the Far Eastern entities in terms of population (49.3 thousand people as of January 1, 2018) (Fig. 1).

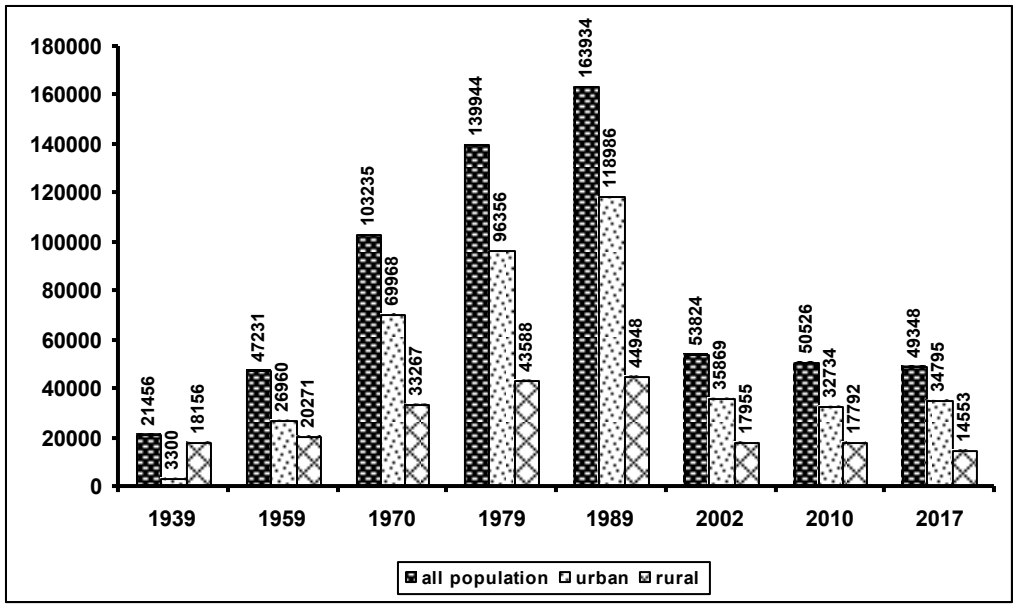

Fig. 1: Population Dynamics of ChAO (1939-2017, ppl)

Changes in the population reflect the stages of economic development of the territory. Two periods can be distinguished: until 1990, when the economic development strategy was based on attracting additional labor resources from other Russian regions, which was reflected in an increase in population growth rates. Therefore, the period of intensive population growth in ChAO lasted from 1939 to 1989 – over these years, the number increased by 142.4 thousand people, or 7.6 times. The urban population had an especially sharp increase – 36 times (from 3.3 thousand people to 118.9 thousand people). In rural areas, the population growth was 2.5 times (18.2 thousand people - 44.9 thousand people). However, during this period, the growth rate of the total number varied unevenly: 3.9% in 1939-1959, 7.3% in 1959-1970, 9.8% in 1970-1979, and 2.1% in 1979-1989 [29]. The population grew rapidly in Bilibino, Anadyr, Chaunsky, and Iultinsky areas.

A characteristic feature of population formation in the previous period is high migration growth due to the influx of population from other Russian regions and republics of the former USSR (Table 1).

Table 1: Dynamics of migration intensity in ChAO (1955-2017, per 1000 ppl) [18, 29, 37, 38, 39]

	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	2000-2004	2005-2009	2010-2014	2015-2017
Influx intensity	236.3	236.4	196.8	147.7	119.5	113.0	88.4	51.4	21.3	25.7	70.2	87.3
Efflux intensity	165.9	156.5	138.4	110.6	110.2	95.4	95.4	149.2	54.9	39.5	74.9	99.1
Migration growth (outflow)	**70.4**	**79.9**	**58.4**	**36.1**	**19.3**	**17.6**	**-7.0**	**-7.8**	**-3.6**	**-3.8**	**-4.7**	**-1.8**

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In 1950-1970, in connection with the creation of the gold mining industry, mines and mining plants were built in the Okrug, and construction of industrial and residential facilities was in progress. To attract labor resources, a program of material incentives began in the Far North. New workers' settlements and urban-type settlements were formed, and the population grew. The main motive for the population movement was high wages due to the northern coefficient and allowances, improved supply of industrial goods compared to other territories, and benefits in the form of state-paid travel to the central regions of the country. The rate of its natural growth had significant impact on the population growth of the okrug (Table 2).

Table 2: Dynamics of Natural Population Growth in ChAO (1955-2017, per 1000 ppl) [4, 5, 6, 18, 29]

	1955-1959	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	2000-2004	2005-2009	2010-2014	2015-2017
Birthrate	28.8	27.5	18.4	17.3	16.5	17.0	16.6	11.1	12.7	13.3	13.8	13.5
Mortality	12.6	7.2	5.9	5.4	4.9	4.6	3.5	5.5	11.0	10.7	11.5	9.7
Natural growth	**16.6**	**20.3**	**12.5**	**11.9**	**11.6**	**12.4**	**13.1**	**5.2**	**1.7**	**2.6**	**2.3**	**3.8**

Population decline since the 1990s determined the second period in population dynamics. After the collapse of the Soviet Union and the transition to a market economy, the changes in the economic environment led to a massive curtailment of production and the closure of enterprises. The migratory influx was replaced by mass migration from ChAO. The role of the state in the development of the northern territories decreased. Therefore, the efflux of the population from the okrug was associated with the elimination of a number of villages where the possibilities for further work of the city-forming enterprises of the gold mining and non-ferrous metallurgy were exhausted, and it was not possible to organize other types of industries. In 2002, the population amounted to 53.8 thousand people, decreasing in 13 years by 110.1 thousand people or 67.2% (in 1989 the population of the okrug was 163.9 thousand people). In the first half of the 1990s, the population of ChAO decreased by 39.5%, while the migration peak occurred in 1992 when the okrug lost 23.3 thousand people (14.5%). In the second half of the 1990s, the efflux decreased to 20%, yet was still high. Since the 2000s, there is a noticeable decrease in population loss (in 2002-2010, the population in the okrug decreased by 6.1%, in 2010-2017 by 2.3%). In general, from 1989 to 2017 the population decreased by 114.6 thousand people, or 69.9% (the largest population loss in the Russian north).

A number of factors determine the intensity of migration exchange: intraregional migration (rural population moving to cities; people moving to more prosperous territories of the subject; nomadic migration of small indigenous peoples, etc.), outflow of youth to promising subjects of the country, departure of people of retirement age to favorable climatic zones, shift labor method. Leaving the Arctic region is also facilitated by state policy aimed at supporting citizens leaving the Far North and equivalent localities, which started in 2002 with the adoption of the Federal Law on 'Housing Subsidies for Citizens Departing from the Far North and Localities Equated to Them'. With some changes and additions, it continues to be implemented at present [14].

In 1990-2017 in Iultinsky and Chaunsky districts, where the majority of newcomers live, a significant population decline occurred due to ongoing migration outflow (in 1990-2002, 79.0% and 77.8%, respectively, in 2002-2017, 28.6 % and 23.5%, respectively). During this period, due to the elimination of a number of villages and to the migration outflow of newcomers, the population of the Bilibino and Anadyr districts also decreased (by 68.5% and

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65.7%, respectively). In the Providensky district, population decreased due to migration outflows and a decrease in natural growth (in 1990-2002 by 53.5%, in 2002-2017 by 20.7%). The smallest decline was in the urban district of Anadyr (the center of ChAO) and in Chukotka (37% and 34.7%, respectively). Since 2002, population grew in Anadyr, amounting to 4.6 thousand people over the past fifteen years. The main flows of migrants from urban and rural settlements were directed to the okrug center for education and employment. Anadyr is the most populated territory of the okrug (15.6 thousand people, 2017) and is characterized by stable positive population dynamics. The outflow of the population is not offset by its natural increase which has a positive trend. In 1990, it was $10.4^{0}/_{00}$, in 2000, it was 1.6, in 2010, it was 0.9, and in 201, it was $3.7\ ^{0}/_{00}$ [4, 5, 6, 19].

During the period of all-Russian depopulation and to the present day, a natural increase is observed in ChAO, facilitated by a younger age structure of the population, which leads to a lower mortality rate and an increased birthrate formed due to the peculiarities of the reproductive behavior of the indigenous ethnic groups of the okrug. In the future, natural growth will not make it possible to compensate for the loss of population in the volumes necessary for the economy and will only have some effect of slowing down the intensity of population loss.

In 2017, according to the total fertility rate ($13.1^{0}/_{00}$) ChAO ranked 2nd in the Far Eastern Federal District and 14th in the Russian Federation. The birthrate dynamics of recent years tends to decrease both the absolute number of births and the total birthrate; this is evidenced by the total fertility rate (TFR). In ChAO in 2011-2017, this indicator increased from 1.812 to 2.079, while still above the average Russian level (1.621). The highest birthrates are observed in the national autonomous okrugs, which is confirmed by the indicators of the total coefficient. The okrug has more than two children on average per woman of reproductive age. The indicator of the total fertility rate tends to decrease (2.079 in 2017, 1.932 in 2025, 1.854 in 2035) [5]. In 2016, TFR amounted to 2.112, approaching the boundary of simple generational replacement. For the urban population, the total fertility rate is significantly lower than simple reproduction: the rural indigenous population, characterized by an expanded reproduction regime (Chukotka and Providenie), provides higher birthrates. A feature of the modern birthrate in ChAO is an increase in the number of illegitimate births. According to this indicator, the okrug ranks the 1st among the Far Eastern subjects (40.2% of the total number of births) and the 3rd in the Russian Federation after the Republic of Tuva (63.3%) and Nenets Autonomous Okrug (40.2%).

Thee mortality rate as a whole depends on the socio-economic development level of the territory, the welfare of the population, including the level of healthcare development and the availability of medical care. There are three periods in the mortality dynamics in ChAO: a sharp increase in mortality up to 12% (1954-1960); a decrease in mortality to 3.9% (1961-1990); an increase in mortality to 11%, that is, by 38.5% (1991-present) compared with the previous period. In 2010-2017, mortality in ChAO was $13.8\text{-}9.4^{0}/_{00}$ [6]. The highest mortality rates are observed in the areas of primary residence of the indigenous population (Chukotsky, Providensky, Anadyr regions), and the lowest in the areas of residence of the alien population (Bilibinsky, Chaunsky districts). The mortality rates in ChAO differ from the average Russian and Far East rates by a higher level of mortality of the working age population and mortality from external causes (Table 3). In 2013-2016, the proportion of deceased men of working age is 1.8 times (and higher) more than of women.

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Table 3: Mortality of the Working-age Population (Number of Deaths per 100,000 ppl) [19, 29]

	Both			**Males Men**			**Females Women**		
	RF	Far East	ChAO	RF	Far East	ChAO	RF	Far East	ChAO
2013	560.9	690.1	987.6	862.6	1017.4	1241.5	236.7	315.7	682.8
2014	565.6	680.5	953.4	868.3	1000.4	1302.8	238.4	312.9	529.3
2015	546.7	659.5	865.8	834.2	964.7	1194.0	234.4	307.3	465.2
2016	525.3	641.5	827.0	800.5	942.2	1107.3	224.9	293.1	483.2

A serious mortality problem in ChAO is that for a long time, a significant proportion of deaths from accidents, poisonings and injuries, that is, from external causes, remains in the structure of mortality causes (Table 4).

Table 4: Mortality by Main Causes of Death in ChAO (per 100,000 ppl) [29]

	2011	2012	2013	2014	2015	2016
Deaths from all causes	1105.2	1139.8	1052.0	1090.1	951.4	996.2
neoplasms	118.4	147.3	114.5	148.4	115.2	156.0
cardiovascular diseases	469.7	455.9	422.4	458.9	476.7	406.1
external causes	232.9	253.5	213.2	199.8	162.9	216.0

External causes are an essential point in mortality rates in the okrug. Positive dynamics is observed in the reduction of these causes in the total number of deaths: 2011 – 21.1%, 2015 – 17.1%, and in 2016 this indicator increased to 21.7%. However, these causes of death still occupy the second place after circulatory system diseases. Mortality from external causes is characterized by a high proportion of deaths at working age, which is primarily associated with the loss of ChAO labor potential. The reduction in mortality from these causes is a significant reserve for the growth of life expectancy.

In 2013-2017, the okrug witnessed a more significant decrease in infant mortality (2.2 times) than in the whole of the Russian Federation (1.5 times) and the Far Eastern Federal District (1.9 times). Despite this, the infant mortality rate in ChAO remains high (10.7), ranking the okrug the 84th among Russian entities.

An important generalized indicator of mortality is life expectancy. The natural and climatic conditions of the North and the Arctic affect the health of the population and its life expectancy. Across the Russian Federation, life expectancy for 1992-2017 increased by 4.36 years and amounted to 72.26 years for both sexes. Among the federal districts, the Far Eastern Federal District has the lowest life expectancy (70.09 years, 2017). Moreover, in the district itself, the indicators of individual constituent entities of the Federation are highly differentiated. Only in the Republic of Sakha (Yakutia), Khabarovsk Krai, Amur and Sakhalin Oblasts, and the Jewish Autonomous Oblast life growth exceeded the Far East level, while in ChAO the indicator was 66.10 years (the lowest life expectancy in the Russian Federation, 2017) (Table 5). Compared with 1992, life expectancy increased by 1.4 years. Increasing the expected life duration to 75 years (up to 80 years by 2030) is provided for in the Decree of the President of the Russian Federation No. 204 of May 7, 2018 [34]. However, it is difficult to accomplish for the northern, especially arctic, subjects since the quality of the population's health declined in the North because the reserve potentials of physiological functions (especially reproductive abilities) are depleted 7-10 years earlier, that is, premature old age sets in.

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Table 5: Life expectancy in ChAO [19]

	Years								
	1992	2017	2030	1992	2017	2030	1992	2017	2030
	All population			**Men**			**Women**		
RF	67.9	72.26	76.58	62.0	67.51	72.54	73.8	77.64	80.35
Far Eastern Federal District	65.6	70.9	73.71	60.1	64.80	69.60	71.8	75.53	77.83
Republic of Sakha (Yakutia)	64.7	71.68	74.87	59.3	66.39	70.78	70.8	77.07	79.81
Kamchatka	65.2	70.06	73.70	60.2	65.21	69.89	70.7	75.25	77.84
Primorsky Krai	65.7	70.36	74.53	60.1	65.34	70.37	72.1	75.50	78.47
Khabarovsk Krai	65.8	69.74	73.76	60.3	64.23	69.22	72.0	75.30	78.09
Amur Oblast	66.2	69.06	72.84	60.9	63.66	68.47	72.2	74.61	77.08
Magadan Oblast	64.2	69.37	72.80	58.2	63.41	68.39	69.8	75.49	77.89
Sakhalin Oblast	66.0	70.19	73.56	60.6	64.59	69.15	71.7	76.09	78.01
Jewish Autonomous Oblast	63.7	68.83	73.22	57.06	63.35	68.64	71.3	74.35	77.61
Chukotka Autonomous Okrug	64.7	66.10	66.13	59.6	60.33	64.89	70.2	71.66	67.67

The change in the population structure associated with demographic aging as a result of migration outflows was reflected in a significant reduction in the proportion of children: in the Republic of Sakha (Yakutia) from 32.1 to 24.7%, in Magadan Oblast from 28.0 to 18.6%, in ChAO from 29.6 to 22.8%, as well as in an increase of people over working age: in Magadan Oblast from 5.1 to 20.3%, in ChAO from 2.8 to 13.2 %, in Kamchatka from 6.0 to 19.8% [19]. Similar trends in the age structure of the population are characteristic of almost all constituent entities of the Russian Federation: there is a decrease in the proportion of children with a simultaneous increase in the proportion of the elderly population. However, the scale of these changes in the northern regions of the Far Eastern Federal District is higher than the Far Eastern and average Russian indicators, and the proportion of people over working age is much lower in comparison with the average Russian level. In ChAO, the share of the working age population (62.3%, 2017) is higher than the Russian (6.3%) and Far Eastern (4.5%) levels. The reduction in the number of able-bodied people, together with an increase in the share of people over working age, represents a serious demographic challenge to providing the okrug economy with labor resources and with an opportunity to improve the quality of life (Table 6).

Table 6: Age Structure of the Population in ChAO (%) [18, 19, 29]

	Younger than working age			Working age			Older than working age		
	RF	Far Eastern Federal District	ChAO	RF	Far Eastern Federal District	ChAO	RF	Far Eastern Federal District	ChAO
1970	28.6	29.7	28.4	56.0	61.9	70.1	15.4	8.4	1.5
1979	23.3	26.9	31.0	60.4	63.8	67.5	16.3	9.3	1.5
1989	24.5	28.1	30.6	57.0	61.5	67.4	18.5	10.4	2.0
2002	17.9	19.0	18.4	61.4	65.6	70.9	20.7	15.4	10.7
2010	16.2	17.4	21.3	61.5	63.4	68.3	22.3	19.2	10.4
2017	18.6	19.8	23.0	56.0	57.8	62.3	25.4	22.4	14.7
2020	18.8	19.9	22.0	54.5	56.6	60.9	26.7	23.5	17.1
2025	18.3	19.5	20.9	53.8	55.9	60.5	27.9	24.6	18.6
2030	16.7	18.0	19.3	54.3	56.4	61.7	29.0	25.6	19.0
2035	15.6	17.1	18.5	54.4	56.4	62.1	30.0	26.5	19.4

The predominant influence of migration growth was a characteristic feature of population formation in ChAO for several decades. Since the 1990s, migration remains the main cause of population decline. Analysis of the distribution of migrants movement in the Arctic subjects is determined by the specifics of the economic development of the territory, the quality of life and the characteristics of labor activity. ChAO, as well as for the

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Murmansk Oblast, the Nenets and Yamalo-Nenets Autonomous Okrugs, the Komi Republic where the shift method of work is developed are characterized by the highest rate of interregional migration among the Far Eastern entities (82.2% upon arrival, 84.6% upon departure, 2017) (Table 7). According to the migration loss coefficient, ChAO ranks the 85th (-13.2, 2017) out of 85 constituent entities of the Russian Federation.

Table 7: Structure of Population Migration Flows in ChAO (%) [5, 6, 37, 38]

	2002	2010	2017	2002	2010	2017	2002	2010	2017
	Intraregional migration			Interregional migration			International migration		
	Arrived								
RF	51.4	49.3	42.0	40.2	41.6	45.6	8.4	9.1	12.4
Far Eastern Federal District	60.2	58.9	50.5	36.3	35.1	35.8	3.5	6.0	13.7
ChAO	18.5	24.6	15.8	68.6	68.0	82.2	12.9	7.4	2.0
	Departed								
RF	53.5	53.3	43.9	41.5	45.0	47.8	5.0	1.7	8.3
Far Eastern Federal District	49.9	45.9	47.3	47.0	51.8	42.5	3.1	2.3	10.2
ChAO	10.8	12.5	13.7	86.5	86.3	84.6	2.7	1.2	1.7

Migration losses significantly reduce the population and the demographic potential of the okrug. Therefore, according to the principles of economic feasibility, enterprises located in the Far North and equivalent areas will continue to use shift and shift-expeditionary methods of organizing work. Since solving the personnel problem at the expense of the local population in ChAO without using modern technologies is rather a difficult task, the shift method of work under state control is suggested when developing new deposits remote from existing settlements, while taking into account the interests of indigenous peoples.

In 2013, the share of intraregional migration in the structure of migration flows increased, amounting to 23.1% of the total volume of migration flows; by 2017, it decreased to 14.7% [38, 39]. The capital of ChAO – the city of Anadyr – is most attractive for intraregional migration; at the same time, more people traveled to other Russian regions from Anadyr than arrived for permanent residence. Migration connections of the okrug municipalities in intraregional exchange have significant differences.

International migrations are generally insignificant, below all-Russian and Far Eastern indicators, and tend to decrease. On average, the share of international migrants in the total number of arrivals in ChAO in 2002 was 12.9%, in 2010 – 7.4%, in 2017 – 2.0%. The proportion of migrants from the total number of those who left was, respectively, 2.7% in 2002, 1.2% in 2010 and 1.7% in 2017. The main (95.3%) share in international migration movements was exchange with the CIS countries; with far-abroad countries, migration relations in ChAO are insignificant. In addition to ChAO, other national-territorial entities – the Republic of Sakha (Yakutia) and the Jewish Autonomous Oblast, also have low attractiveness for international migrants. However, the degree of intra-Russian migration does not significantly affect the characteristics of the ethnic structure and ethno-political processes in the subjects of the Far Eastern Federal District. The main migration flow in the District is associated with the implementation of large projects; however, largely these are one-off ‘rotational’ movements typical for extractive entities – Sakhalin Oblast, the Republic of Sakha and ChAO.

Analysis of the age composition of people involved in migration processes shows that people of working age are the more mobile part of the population of the okrug – their proportion among migrants exceeds the average Russian indicators, which is associated with the shift method of work and the outflow of people of retirement age to subjects with more favorable climatic conditions. A high proportion of the able-bodied population among migrants

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contributes to the demographic stability of the region, acting through the rejuvenation of the demographic potential. A feature of ChAO is the active departure of people of retirement age from the harsh climatic zone.

Despite the climatic features, unique ethnic habitats of the indigenous peoples of the North – the Chukchi, Eskimos, Evens, Chuvans, the Yukagir – historically emerged in Chukotka and found their own ways of survival. According to the 2010 All-Russian Population Census, their population is 35.1% of people who indicated their nationality [15, 28, 29, 39]. The newcomers changed the national composition of the okrug. According to the 1939 census, the Russian population steadily increased from 1959 to 1989 – 3.8 times (from 28.3 to 108.3 thousand people). In 1989-2010, its absolute population dropped by 76.8% (83.2 thousand people), amounting to 25.1 thousand people in 2010 [39]. In the 1990s, a significant part of the Ukrainian population left ChAO, reducing their proportion in the okrug in 2010 by almost ten times. The situation is similar with Belarusians and other immigrants from the former Soviet republics who after the collapse of the USSR created flows of migrants returning to their former place of residence. Thus, the number of Belarusians decreased more than eight times from 1989 to 2010.

According to the 1939 census, the number of the Chukchi, Evens, Eskimos and Koryaks was 71% of the total population, then decreased, making up 25.8% in 1959, 16.2% in 1970, 9.8% in 1979, and 9.7% in 1989 (the lowest percentage of the indigenous population in the history of ChAO). In 1989-2002, the indigenous population increased by 5.4% and amounted to 16,754 people. While the proportion of newcomers decreased, the proportion of the Chukchi, Eskimos and Evens increased. By 2010, the proportion of the indigenous population in the national composition of ChAO increased slightly (Table 8), which can be considered a positive fact, since migrants from near and far abroad are unlikely to form a stable basis for the demographic potential.

Women over working age dominate the age structure of the indigenous population (from 8.8% among the Chukchi to 16.9% among Chuvans, 2010). Among children and adolescents, the percentage of men among Chuvans, the Yukagir, Eskimos and Evens is higher. In 2002, women prevailed among the Chukchi in this age group (59.6%), and by 2010 their number decreased by 30.2%. In general, the proportion of people under working age declined among Chuvans, Eskimos, Evens, and the Chukchi. The growth was observed among the Yukagir (by 7.8% in men and by 11.5% in women).

Table 8: Dynamics of the Most Numerous Nationalities of Newcomers and the Indigenous Population in ChAO (1939-2010, ppl) [39]

	1939	1959	1970	1979	1989	2002	2010
Population	21524	46689	101184	139944	163934	53824	50526
including:							
newcomers	5814	32439	82593	118994	138942	33395	28301
Russians	5183	28318	70531	96424	108297	27918	25068
Ukrainians	571	3543	10393	20122	27600	4960	2869
Belarusians	60	578	1663	2448	3045	517	364
indigenous population	15285	12034	13381	13767	15901	16757	16857
the							
Chukchi	12111	9975	11001	11292	11914	12622	12772
Evens	817	820	1061	969	1336	1407	1392
Eskimos	2046	1064	1149	1278	1452	1534	1529
Chuvans	-	-	-	-	944	951	897
the Yukagir							
Koryak	-	103	109	144	160	185	198
	311	72	61	84	95	55	69

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Over the last census period (2002-2010), the share of the working age population among the Chukchi, Chuvans, Eskimos and Evens increased. Among the Yukagir, there is a decrease in this age group by 13.4% in men and by 10.3% in women. The number of people over working age among the Yukagir, Chuvans, Eskimos and Evens increased as well; moreover, the life expectancy of the indigenous peoples of the North lags behind this indicator among other peoples living in ChAO. Thus, the average age of the Russian population according to All-Russian Population Census 2010 was 34.9 years, of the Ukrainians 45.7 years, Belarusians 45.6 years, Chuvans 31.0 years, Eskimos 29.4 years, Evens 29.0, the Yukagir – 28.8 years, the Chukchi – 27.8 years.

Among the main socio-economic problems of the indigenous peoples in ChAO is the low life standards. The purchasing power is not only 2.9 times lower than the regional average but also 2 times lower than the average Russian level, which is explained by low wages in traditional environmental management sectors. The unemployment rate among indigenous minorities is 1.2 times higher than in ChAO; the life expectancy is 15.5 years lower than the national average indicator. Other issues include: an increase in the number of socially significant diseases; high mortality rate (including infant and working age); the inadequacy of the education and healthcare to the needs of indigenous peoples and problems in the field of traditional nature management – reduction of rangelands for reindeer husbandry, lack of financial resources, lack of material and technical base, lack of qualified personnel and of professional orientation of young people towards employment in traditional fields of activity [2, 7, 21-25, 32, 33].

One of the main directions of the RF Arctic policy is a model for the sustainable development of the Arctic territories, providing a comprehensive approach to solving the socio-economic problems of the indigenous populations – creating conditions for self-development and self-sufficiency; sustainable exploitation of resources, development of the region's infrastructure, and ensuring the participation of indigenous communities in large-scale projects; environmental protection, limiting the negative impact of industrial activity on the territory of nature management of the indigenous peoples; and preserving the biodiversity of the region [9].

IV. CONCLUSION

The present analysis of the demographic situation in the North-East of Russia, using the example of Chukotka Autonomous Okrug, shows that without active intervention in the processes taking place here, population decline will continue due to the interregional migration outflow exceeding the natural population decline. The Federal State Statistics Service when assessing 'Estimated population in ChAO until 2035' makes the same forecast [17]. If the current state of affairs in the demographic sphere stays the same, the following trends will be observed in ChAO:

1. According to the estimates up to 2035 made by the Federal State Statistics Service (based on the average version of demographic processes development at the beginning of 2018), decline of permanent population in ChAO will continue. By 2025, it will amount to 47.3 thousand people, decreasing by 2.0 thousand people compared with 2017 (2035 – 45.4 thousand people) [17]. A steady trend of migration outflow indicates no changes in the current situation. Therefore, the population growth in ChAO by 6.0 thousand people recorded by the Concept of Demographic Policy of the Far East for the period until 2025 can be considered very optimistic [8].

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2. Population decline will occur due to migration outflows that exceed the natural population decline. It is assumed that the natural decline will be reduced from 70 people in 2019 to 1 person in 2030, and then the natural increase will begin, reaching 70 people by 2035. The annual number of deaths will remain at the level of 444-584 people, and the number of births decreases every year from 514 people (10.5 births per 1000 population in 2019) to 474 people (10.2 births per 1000 population per 1000 population) in 2030 [17].
3. The reduction in the number of able-bodied people, together with an increase in the number of people over working age, represents a serious demographic challenge to providing the district economy with labor resources and with the opportunity to improve the quality of life.
4. Given the growing geopolitical and economic importance of the Northeast for Russia, it is necessary to quickly reverse the negative trends in the demographic sphere of this region.
5. One of the main directions of the RF Arctic policy is a model for the sustainable development of the Arctic territories, which provides a comprehensive approach to solving the problems of socio-economic development of the indigenous peoples of the North.
6. A necessary condition for the economic development of ChAO is a more complete consideration of specific regional factors. Therefore, issues of socio-economic development at the regional level must be considered in connection with the characteristics of demographic processes.

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