

UDC: [332.14+37](943.8)(045)

DOI: 10.37482/issn2221-2698.2020.39.160

## Revisiting the Quality of Area Planning Schemes in Terms of the Educational Institutions Network Development at the Municipal Level in the Extreme North Regions\*

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**Abstract.** A lot has been said about the low quality of territory development programs at the regional and municipal levels in Russian literature. However, rare examples are given to confirm this thesis. In the case of such closely related issues as demographic and the education system development at the municipal level, we consider the territorial planning schemes and show these issues are not given sufficient attention. In terms of demography, the main disadvantages are an insufficiently detailed analysis of the age distribution of the population and its dynamics, analysis of a very short period (1–4 years), underestimation of existing trends (e.g., a wave-like change in the population), and an extremely weak demographic forecast. Concerning the education system, the main disadvantages are a short review horizon (1–3 years), insufficient analysis of trends and justification of the proposed measures, the use of planned rather than real indicators, which leads to an underestimation of demographic trends, insufficient analysis of the accessibility of education institutions. A more detailed analysis of indicators over a greater number of years should be carried out to improve the quality of the schemes. When developing them, it is necessary to involve a specialist in demographic forecasting. Finally, it is required to create a model scheme that can be guided by developing schemes at the municipal level.

**Keywords:** *Extreme North, educational system, territorial planning scheme, municipal administration, development, forecasting.*

### Introduction

In our previous article, we showed that insufficient attention is paid to education issues in federal program documents on the development of the Arctic [1, Sinitsa A.L.]. The development in them is understood primarily as the development of the resource base and scientific research on Arctic issues, and not the complex development of the territory as a whole and all levels of the education system in particular. Representatives of authorities in these regions believe that the basis should be sustainable socially oriented development of all spheres of life. Experts confirm this point of view [2, Tsukerman V.A., Goryachevskaya A.S.; 3, Lytkina T.S., Smirnov A.V.]. This thesis becomes even fairer, given that the development of any territories is based on local context [4, Pilyasov A.N., Zamyatina N.Yu., p. 8; 5, Makarov V.L.], that is, the interests of the population living on them, as confirmed by the President of Russia V.V. Putin in his Address to the Federal Assembly on January 15, 2020, noting: “People want development and themselves strive to move forward in the profession, knowledge, in achieving prosperity, are ready to take responsibility for specific

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\* For citation:

Sinitsa A.L. Revisiting the Quality of Area Planning Schemes in Terms of the Educational Institutions Network Development at the Municipal Level in the Extreme North Regions. *Arktika i Sever* [Arctic and North], 2020, no. 39, pp. 160–181. DOI: 10.37482/issn2221-2698.2020.39.160

matters. Often, they know better what, why, and how to change where they live, work, — in cities, districts, villages, throughout the country”<sup>1</sup>.

Such a statement of the question at the federal level shifts the emphasis to lower ones. It is the position of regional and municipal authorities that becomes the main one. Therefore, the results obtained depend on the quality of the regulatory framework at these levels of government, especially when we consider that there is no separate development program for the Extreme North in the country. It is understandable since a significant territorial extension and differentiation characterize the Extreme North according to most indicators. It also means that each region and municipality solve its problems to the best of its understanding of their dynamics in the face of adverse demographic trends and rapid changes in society.

The different financial and organizational capabilities of the regions and their parts are another reason for the significant differences between the administrative-territorial units. In this regard, the professional competencies of experts and state and municipal employees who participate in the development of programs, as well as the availability of standard documents that can be used in the development of documents that already take into account local specificities, are of great importance. Significant differences do not allow the use of standard forms directly without considering regional and local specifics. Still, they usually consider the most essential aspects and provide key indicators and standards, so it is imperative to focus on them.

### *Subject and method*

Over the past 10-15 years, many documents have been adopted on the development of education. They have different qualities and different content, and their comparison can give a lot of information about the dynamics and development prospects of a particular region of the Extreme North. Despite the great practical significance, there are few works in which such comparisons are carried out. A detailed analysis of action plans for each region far exceeds the scope of this article. Such work can be done for each region, and it would be good if specialists who understand the local specifics do it. It will improve the quality of governance in any region of the Extreme North.

This work aims to analyze the legal and regulatory documents at the municipal level in the regions of the Extreme North, which address issues of planning the development of the education system. First of all, we are interested in how they reflect and take into account demographic trends and prospects for changes in the number of corresponding age groups, how the dynamics of changes in the number of educational institutions are presented, and what measures are being implemented. We are interested in the municipal level since preschool, and school education is in its area of responsibility. The placement of vocational education facilities is also carried out, considering the peculiarities of the development of municipalities. We consider territorial planning

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<sup>1</sup> Poslanie Prezidenta Federal'nomu Sobraniyu Rossiyskoy Federatsii [Address to the Federal Assembly of the Russian Federation]. URL: <http://kremlin.ru/events/president/news/62582> (accessed 12 February 2020).

schemes, master plans of settlements (urban districts), and the materials attached to them (documents on the justification of schemes). Their functions and goals are presented in Art. 18–21, 23–28 of the Town Planning Code of the Russian Federation. It is essential for us that it is based on these documents that new buildings and structures are introduced into the education system, and old or unnecessary are withdrawn. They are the last stage in planning socio-economic development at the local level. Therefore, for their development, they require knowledge of the trends in the socio-economic development of the territory. Such schemes are used not only in Russia but also in foreign countries [6, Stroyev P.V., Reshetnikov S.B.].

This task is urgent, since much has been said about the insufficient interaction of different levels of management, the disagreement of goals, methods, and means within the framework of one document, as well as the fact that the contradictions between the documents have gained considerable scope (e.g., see [7, Bobkov V.N., etc. ]). All this worsens the manageability of socio-economic systems, leads to a decrease in domestic connections, mosaic development and imbalances in the resettlement system, because if there is no forecast for a change in the population size agreed between the regional and municipal levels of government, then education plans between them will inevitably result in mismatches.

The duality of development, due to geographical location and historical trends, leads to the fact that Russia among foreign researchers by its main characteristics is defined as “like Europe, but not Europe, like Asia, but not Asia” [8, Syuelin G., Men Ch., p. 243]. As a result, some representatives of science believe that Russia should “fix itself as a “civilization of the North” [9, Ryazanov V.T., p. 646] or simply say that Russia is a northern country [10, Pichurin I.I., p. 158]. It is mostly a fair statement, because “after the collapse of the Soviet Union, Russia became, even more, a northern country” [11, Timoshenko A.I., p. 48], and the territory of the Extreme North occupies two-thirds of its entire area.

In order to understand how the issues of the development of the education system are reflected in the territorial planning schemes in each considered region, which is wholly or partially related to the regions of the Extreme North, we selected one municipal entity. We analyzed materials to substantiate the schemes that operate in them. Territorial planning schemes or general plans for the following municipalities were selected: Beloyarsky municipal district<sup>2</sup> (Khanty-Mansi Autonomous Okrug), Bilibinskiy municipal district<sup>3</sup> (Chukotka Autonomous Okrug), Bodaybinskiy municipal region<sup>4</sup> (Irkutsk Oblast), Verkhnebureinskiy<sup>5</sup> municipal region (Khabarovsk Krai), Knya-

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<sup>2</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Beloyarskiy Khan-ty-Mansiyskogo AO [The scheme of territorial planning. Justification materials. Municipal district Beloyarsky of the Khanty-Mansi Autonomous Okrug]. URL: <http://www.admbel.ru/upload/iblock/6fa/6fa6bcb03e065be-85ac25015844eb4e0.pdf> (accessed 02 April 2020).

<sup>3</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Bilibinskiy Chukotskogo AO [The scheme of territorial planning. Justification materials. Municipal district of Bilibinskiy, Chukotka Autonomous Okrug]. URL: <http://www.bilchao.ru/engine/download.php?id=718> (accessed 02 April 2020).

<sup>4</sup> Skhema territorial'nogo planirovaniya. Munitsipal'nyy rayon Bodaybinskiy Irkutskoy oblasti [The scheme of territorial planning. The municipal district of Bodaybinskiy, Irkutsk Oblast]. URL: <http://bodaybo38.ru/qa/99.html> (accessed 02 April 2020). Materialy po obosnovaniyu skhemy territorial'nogo planirovaniya Munitsipal'nogo rayona Bodaybinskiy

zhmogostskiy municipal region<sup>6</sup> (Komi Republic), Kolskiy municipal region<sup>7</sup> (Murmansk Oblast), Kondopozhskiy municipal region<sup>8</sup> (Republic of Karelia), Lenskiy municipal region<sup>9</sup> (Arkhangelsk Oblast), Muyskiy municipal region<sup>10</sup> (Republic of Buryatia), Nadymkiy municipal region<sup>11</sup> (Yamal-Nenets Autonomous Okrug), Neryungrinskiy municipal region<sup>12</sup> (The Republic of Sakha (Yakutia)), Noglikiy municipal district<sup>13</sup> (Sakhalin Oblast), Parabelskiy municipal region<sup>14</sup> (Tomsk Oblast), Penzhinskiy municipal region<sup>15</sup> (Kamchatskiy Krai), Severo-Eniseyskiy municipal region<sup>16</sup> (Krasnoyarsk

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Irkutskoy oblasti [Materials on the substantiation of the territorial planning scheme of the Municipal District of Bodaybinskiy, Irkutsk Oblast]. URL: <http://bodaybo38.ru/qa/100.html> (accessed 02 April 2020).

<sup>5</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Verkhnebureinskiy Khabarovskogo kraia [The scheme of territorial planning. Justification materials. Municipal district Verkhnebureinsky Khabarovsk Krai]. URL: <https://yadi.sk/d/987e72la3FQLoq> (accessed 02 April 2020).

<sup>6</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Knyazhpogostskiy Respubliki Komi [The scheme of territorial planning. Justification materials. Municipal district of the Knyazhpogostskiy Republic of Komi]. URL: <http://www.mrk11.ru/content/menu/194/STP-Knyagh.rar> (accessed 02 April 2020).

<sup>7</sup> Skhema territorial'nogo planirovaniya. Munitsipal'nyy rayon Kol'skiy Murmanskoy oblasti [The scheme of territorial planning. Municipal district of Kola, Murmansk Oblast]. URL: [https://akolr.gov-murman.ru/deyatelnost/gradostroitelstvo-i-zemelye-otnosheniya/dokumenty-territorialnogo-planirovaniya.php?clear\\_cache=Y](https://akolr.gov-murman.ru/deyatelnost/gradostroitelstvo-i-zemelye-otnosheniya/dokumenty-territorialnogo-planirovaniya.php?clear_cache=Y) (accessed 02 April 2020).

<sup>8</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Kondopozhskiy Respubliki Kareliya [The scheme of territorial planning. Justification materials. Municipal district Kondopozhskiy, Republic of Karelia]. URL: <http://amsu.kondopoga.ru/58159/poselenia/29710/> (accessed 02 April 2020).

<sup>9</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Lenskiy Arkhangel'skoy oblasti [The scheme of territorial planning. Justification materials. Municipal district of Lenskiy, Arkhangelsk Oblast]. URL: <http://www.yarensk.ru/city/grad/sxemaLensk.php> (accessed 02 April 2020).

<sup>10</sup> Skhema territorial'nogo planirovaniya. Munitsipal'nyy rayon Muyskiy Respubliki Buryatiya [The scheme of territorial planning. Municipal district of the Muyskiy, Republic of Buryatia]. URL: [https://www.admmsk.ru/File\\_upload/Terr\\_Plan/Doc/tom\\_i.doc](https://www.admmsk.ru/File_upload/Terr_Plan/Doc/tom_i.doc) (accessed 02 April 2020). Materialy po obosnovaniyu skhemy territorial'nogo planirovaniya Munitsipal'nogo rayona Muyskiy Respubliki Buryatiya [Materials on the justification of the territorial planning scheme of the Municipal District of the Muyskiy, Republic of Buryatia]. URL: [https://www.admmsk.ru/File\\_upload/Terr\\_Plan/Doc/tom\\_ii.doc](https://www.admmsk.ru/File_upload/Terr_Plan/Doc/tom_ii.doc) (accessed 02 April 2020).

<sup>11</sup> Skhema territorial'nogo planirovaniya. Munitsipal'nyy rayon Nadymkiy Yamalo-Nenetskogo AO [The scheme of territorial planning. Municipal District of Nadymkiy, Yamal-Nenets Autonomous Okrug]. URL: <http://nadymregion.ru/upload/%D0%9E%D1%81%D0%BD%D0%BE%D0%B2%D0%BD%D1%8B%D0%B5%20%D0%BF%D0%BE%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D1%8F.doc> (accessed 02 April 2020). Materialy po obosnovaniyu skhemy territorial'nogo planirovaniya Munitsipal'nogo rayona Nadymkiy Yamalo-Nenetskogo AO [Materials on the substantiation of the spatial planning scheme of the Municipal District of the Nadymkiy, Yamal-Nenets Autonomous Okrug]. URL: <http://nadymregion.ru/upload/%D0%9E%D0%B1%D0%BE%D1%81%D0%BD%D0%BE%D0%B2%D0%B0%D0%BD%D0%B8%D0%B5.doc> (accessed 02 April 2020).

<sup>12</sup> Reshenie Neryungrinskogo rayonnogo Soveta deputatov. Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Neryungrinskiy Respubliki Sakha (Yakutiya) [Decision of the Neryungrinsky District Council of Deputies. The scheme of territorial planning. Justification materials. Municipal district of the Neryungrinskiy, Republic of Sakha (Yakutia)]. URL: [http://www.neruadmin.ru/upload/11-42\\_22.12.2017.pdf](http://www.neruadmin.ru/upload/11-42_22.12.2017.pdf) (accessed 02 April 2020).

<sup>13</sup> General'nyy plan. Gorodskoy okrug Noglikiy Sakhalinskoy oblasti [General plan. The municipal district of Noglikiy, Sakhalin Oblast]. URL: [http://www.nogliki-adm.ru/assets/files/docs/Gen\\_plan/GPProekt.zip](http://www.nogliki-adm.ru/assets/files/docs/Gen_plan/GPProekt.zip) (accessed 12 February 2020).

<sup>14</sup> Skhema territorial'nogo planirovaniya. Munitsipal'nyy rayon Parabel'skiy Tomskoy oblasti [The scheme of territorial planning. Municipal region Parabelskiy, Tomsk Oblast]. URL: <http://www.parabel.tomsk.ru/files/Arhitektura/polozh.pdf> (accessed 12 February 2020). Materialy po obosnovaniyu skhemy territorial'nogo planirovaniya Munitsipal'nogo rayona Parabel'skiy Tomskoy oblasti [Materials on the justification of the territorial planning scheme of the Municipal District of Parabelskiy, Tomsk Oblast]. URL: <http://www.parabel.tomsk.ru/files/Arhitektura/obosnov.pdf> (accessed 12 February 2020).

<sup>15</sup> Skhema territorial'nogo planirovaniya. Materialy po obosnovaniyu. Munitsipal'nyy rayon Penzhinskiy Kamchatskogo kraia [The scheme of territorial planning. Justification materials. Municipal district of Penzhinsky of the Kamchatka

Krai), Srednekanskiy municipal district<sup>17</sup> (Magadan Oblast), Todzhinskiy kozhuun<sup>18</sup> (Respublika Tyva).

All these municipalities are in areas of the Extreme North or equivalent localities. This sample is not representative of the geographical location of municipalities since, e.g., Lensky municipal district is located in the south of Arkhangelsk Oblast and, possibly, there are features more characteristic of the Extreme North regions in Mezensky municipal district. Also, we work with only a small part of all available schemes. However, from a substantive point of view, it is not important for the analysis which of these municipal areas to study. As we show below, territorial planning schemes at the municipal level have common conceptual flaws, which are characteristic of the vast majority of them.

Moreover, the cited shortcomings are present in most territorial planning schemes for municipalities located outside the Extreme North. From this point of view, the selection of schemes is reasonable and representative. Having considered these schemes, we will get enough information to draw conclusions on the quality of municipal territorial planning schemes throughout the Extreme North and give recommendations for improving them using the available examples. It should also be noted that if we look at the schemes developed by one institution for different municipalities, the qualitative differences can be quite significant. It means that not only the features of the municipality play an important role but also the qualifications and personal qualities of the performers responsible for developing the schemes.

The conceptual foundations of developing development programs using the example of the Arctic are presented in the work of V.N. Laksin and B.N. Porfiryev [12]. More general principles for working out development programs are presented in articles by V.L. Tambovtsev [13–14]. They are not specifically devoted to education but contain many provisions that can be applied to this area. The importance of supplementing the plans for territorial development with forecasts of the dynamics of the population reproduction, considering local characteristics and balances, is also noted by specialists [15, Lazhentsev V.]. Even in the USSR, experts insisted on linking urban devel-

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Krai]. URL: <http://m.пенжинский-район.пф/tinybrowser/files/imushcestvo/zemlya/territorial-noe-planirovanie/she-ma-territorial-nogo-planirovaniya.rar> (accessed 12 February 2020).

<sup>16</sup> Materialy po obosnovaniyu skhemy Munitsipal'nogo rayona Severo-Eniseyskiy Krasnoyarskogo kraya [Materials on the justification of the scheme of the Municipal District of the Severo-Eniseyskiy, Krasnoyarsk Krai]. URL: <http://www.admse.ru/bitrix/tools/pixelcraft.document/download.php?action=download&hash=QyYcUD5fLD5aMR4zAj8WAmIhelk3> (accessed 12 February 2020).

<sup>17</sup> General'nyy plan. Gorodskoy okrug Srednekanskiy Magadanskoy oblasti [General plan. The Municipal District of Srednekanskiy, Magadan Oblast]. URL: [http://storage.inovaco.ru/media/project\\_mo\\_193/79/62/70/0a/76/76/srednekanskij\\_g\\_o\\_tom\\_1\\_gp-p.doc](http://storage.inovaco.ru/media/project_mo_193/79/62/70/0a/76/76/srednekanskij_g_o_tom_1_gp-p.doc) (accessed 12 February 2020). Materialy po obosnovaniyu general'nogo plana Gorodskogo okruga Srednekanskiy Magadanskoy oblasti [Materials on the substantiation of the general plan of the City District of the Srednekanskiy, Magadan Oblast]. URL: [http://storage.inovaco.ru/media/project\\_mo\\_193/cb/bd/9c/7d/9d/7d/srednekanskij\\_g\\_o\\_tom\\_2\\_mo.doc](http://storage.inovaco.ru/media/project_mo_193/cb/bd/9c/7d/9d/7d/srednekanskij_g_o_tom_2_mo.doc) (accessed 12 February 2020).

<sup>18</sup> Skhema territorial'nogo planirovaniya. Kozhuun Todzhinskiy Respubliki Tyva [The scheme of territorial planning. Todzhinsky kozhuun, Republic of Tuva]. URL: <http://todzhinsky.ru/files/files/2018-10-25-773967315.doc> (accessed 12 February 2020). Materialy po obosnovaniyu skhemy territorial'nogo planirovaniya Todzhinskogo kozhuuna Respubliki Tyva [Materials on the substantiation of the territorial planning scheme of the Todzhinsky kozhuun, Republic of Tuva]. URL: <http://todzhinsky.ru/files/files/2018-10-25-1328994770.docx> (accessed 12 February 2020).

opment planning schemes and development planning schemes for larger territories, since their mismatch inevitably leads to serious errors [16, Khorev B.S., pp. 197, 212–221].

Nevertheless, the quality of Arctic development programs [17, Leksin V.N., Porfiriyev B.N.] and development programs as a whole [18, Bukhvald E.M., Kolchugina A.V.] continues to be low, incl. and due to inconsistency of documents, although there are examples of a high degree of consistency [19, Zhikharevich B.S., Lebedeva N.A.]. This problem is a part of a more general problem of the availability of statistics and its processing [20, Bessonov V.]. It is especially true for the municipal level. At this level, a significant amount of managerial decisions is made that affect the life of the population most directly. Therefore, high requirements should be applied to the quality of information and analytical support, especially since local authorities should know their statistical indicators better than authorities or researchers at the regional or even at the federal level.

Territorial planning schemes are the result of the development of conceptual (for 25-30 years) programs for the development of the territory. The methodological foundations for creating these schemes in modern literature are also given in sufficient detail [21, Vilner M.Ya.; 22, Maloyan G.A.; 23, Mityagin S.D.]. In the works, much is said about the low quality of circuits and the presence of serious flaws [21, Vilner M.Ya.; 24, Polivaeva O.G.], their inconsistency at all levels [25, Nekrasov I.B., Glotina I.M.; 26, Nesterova A.A.] and problems in organizing competitions and choosing a developer [27, Kosykh P.A., Petrishchev V.P.]. These specific problems indicate that the planning system for the development of municipal territories is at the initial stage, which was noted in the 1960–the 1970s [16, Khorev B.S., p. 211–212].

If we consider the experience of the USSR, it should be noted that in theoretical studies, much attention was paid to the justification of the complexity of development plans [16, Khorev B.S.; 28, Khorev B.S.; 29, Borschevsky M.V.; 30, Korenevskaya E.I.]. Much attention was paid to the development of the education system in territorial plans ([29, Borschevsky M.V.; 30, Korenevskaya E.I.; 31, Aitov N.A.], etc.).

Before starting work, we studied educational development programs and related action plans at the regional level. An analysis of the development programs of education systems in the regions of the Extreme North showed that they formulated goals and identified priorities. Nevertheless, they often do not provide information on the number of young people and their groups, their dynamics, which is very important in the context of a wave-like change in the population, the number of education institutions in the region and their problems (physical deterioration of buildings, suboptimal distribution, low staff pay, equipment of education institutions and similar indicators). Also, essential indicators such as the coverage of the population of all ages by the education system, the needs of the economy in the workforce of a certain level of education, qualification and professional composition may not be distinguished. Instead, issues that are also important are considered, but their significance is much lower compared to these. If such significant aspects are not considered in full, then it can be assumed that even less attention will be paid to them at the

municipal level. Besides, indicators are given for a specific date or in just a few years, which is not enough to reveal trends.

### *Analysis of demographic trends in territorial planning schemes*

Territorial planning schemes for education do not allow them to fulfill what they are created for. The information displayed is partly consistent with the objectives of the document, but not its spirit. Such an essential criterion of schemes as the comprehensive planning of economic and social development is not fulfilled. When B.S. Khorev wrote that “local (a kind of “municipal”) planning” [16, p. 200] only recently has spread and there are errors, it could be understood, because it was about the 1970s. However, since then, science has stepped forward, and an integrated approach should underlie any socio-economic planning.

The physical component of the territory can be described in detail in a scheme: water resources are described, mineral resources are presented, what is the volume of deposits and which ones are developed, climatic features are displayed and how they affect socio-economic development, even animals in general and game animals, in particular, are reflected in the document in detail. All this can take from 50 to 150 pages. No one disputes that this section is essential. Still, the section describing the dynamics of the population is no less important, since it is demographic development that determines how feasible the plans for socio-economic development are. Is it impossible to describe the observed trends at least on the 7-10 pages of this section and do it not just formally, but in such a way that it is clear from the scheme how much the territory is provided with human resources? It is complicated for a user from far away to obtain high-quality municipal demographic statistics in the right amount. Still, the scheme is developed at the request of the municipal authorities, which should have such data. Hence, the argument about the unavailability of information, in this case, is not applicable.

In all the considered territorial planning schemes, a demographic section is presented. However, it is not always in a satisfactory condition. For the municipal level, the use of crude coefficients is justified, since the calculation of more complex indicators (e.g., total fertility rate or life expectancy for any age) can sometimes be difficult for them (especially in the context of settlements). However, there are more serious disadvantages.

The sex distribution of the population provides some useful information, but its absence is not a critical drawback. In contrast, the age structure of the population is significant for assessing the socio-economic development of a municipal district. Still, in many documents, it is not presented at all (e.g., the schemes of Bilibinsky and Neryungrinsky municipal districts) or is presented by enlarged social and economic groups: younger than working age, working-age, older than working age (e.g., schemes of Bodaybinsky and Kondopozhsky municipal districts). In the scheme of Srednekansky urban district, there are no absolute numbers, and only the percentage distribution of groups is given. Such a division is not suitable for assessing the education system since data are needed on children at preschool and school ages, as well as on young people at the age of voca-

tional education if there are corresponding educational institutions in a municipality. In the absence of the entire age structure, children in preschool and school ages are distinguished in the population section in the scheme of Muysky municipal district. In this case, data on the total population and the number of enlarged groups is an information indicator as informative as it is such an indicator as to the overall temperature in the hospital or its departments. As positive examples, territorial planning schemes can be singled out in which the age structure of the population is represented graphically in the form of a sex and age pyramid (Verkhnebureinsky and Penzhinsky municipal districts, as well as the Nogliksky urban district, in which data are presented for five-year age groups) or in the form tables (Knyazhpogostsky municipal district, Todzhinsky kozhuun).

The marital structure of the population is of some interest since it affects fertility and mortality, but its absence only slightly worsens a scheme. It is given, e.g., in the scheme of the Penzhinsky municipal district. The educational structure is more important for the labor market and is largely determined by migration, therefore its importance for planning the development of the education system is less important (it is presented, e.g., in the scheme of the Verkhnebureinsky municipal district). In addition, children under 18 years of age mostly have general education, and higher levels of education are already under the authority of the state.

The regions of the Extreme North are distinguished by a large migration movement, which largely determines the demographic dynamics, so it is worth paying great attention to the analysis of migration. As a fairly good example, we can point to the schemes of the Verkhnebureinsky, Nadymsky, and Penzhinsky municipal districts.

In most schemes, demographic indicators and population dynamics are given for a short period of 3-4 years. This period is not enough, because the wave-like dynamics of the population has a significant impact on the ongoing processes in the field of education and on the need for places in educational institutions, forcing to take into account periods of decline and increase in the number of children. This is another argument in favor of the need to include the age structure of the population in a scheme. The dynamics of indicators and age structure should be presented for a longer period, as is done in the schemes of Knyazhpogostsky, Nadymsky, Neryungrinsky, and Penzhinsky municipal districts. In the scheme of Bodaybinsky municipal district, in addition to a long time series of indicators, its demographic history of the district is described in detail.

Despite the presence of the demographic wave, the general trend in the dynamics of the share of children in the entire population is bearish [1, Sinitsa A.L.; 32, Sinitsa A.L.], and the share of the population older than working age is growing. If data are presented on the total population or for a short period, these especially important changes will not be considered.

Finally, it is necessary to say about the quality of the analysis of the available data. Given the above comments, it is satisfactory since most of the documents present and analyzes the main demographic trends. Of the schemes considered, we most liked the schemes of Bodaybinsky, Verkhnebureinsky, Penzhinsky municipal districts, which we can recommend as the most interest-

ing and informative. As examples of an insufficient analysis, we can cite the schemes of Bilibinsky and Muysky municipal districts.

### *Demographic forecast in territorial planning schemes*

The forecast of the population is presented much worse. A considerable number of new disadvantages are added to the existing ones, which raises the question of the need to include a profile specialist in demography in a development team.

The most important of them is that the forecast is provided for only three years: the year of creating the scheme, the year of completion of the first stage, and the year of completion of the entire forecast. It is consistent with established practice, but it is methodologically incorrect since it does not allow substantiating the planning of the placement of objects of the education system. Despite the general downward trend in the dynamics of the number of children, the demographic wave leads to significant fluctuation in the number of children over 10-15 years. If the developer cites data for only three years with a large interval between them, then the dynamics trends will not be taken into account, e.g., since the year of the end of the planning period is a local maximum and the number of children in other years will be less. It means that there may be significant excess capacities in the education system, which will require funds for their maintenance. A similar situation is possible when the end of the planning period is a local minimum, and there can be a shortage of places in educational institutions.

The demographic wave does not affect all municipalities (e.g., in the case of a significant departure of the population, it may be interrupted). However, still, there are enough of them to talk about the need to provide information at least every two to three years, or more often. It will improve the prognostic qualities of the document, as well as better justify the planned goals and the possibility of achieving them. The same conclusion holds for migration. As an example of a planning document, where the forecast is given for a more significant number of years, we can cite the territorial planning scheme of the Bilibinsky municipal district.

The developed forecast can be presented for settlements, though not always (e.g., in the scheme of the Severo-Yeniseysky municipal district, information is given only for the entire population as a whole). It is correct, but even then, only one scenario is often presented, which is not enough. A population forecast interval is needed (it is presented in the schemes of Verkhnebureinsky, Kondopozhsky, Parabelsky, Penzhinsky, and Severo-Yeniseysky municipal districts), which can be substantiated using the cohort-component method or probabilistic methods at a significance level of 66% or less.

Due to the small population of the municipal district, difficulties may arise in developing the most familiar and widespread forecast based on the cohort-component method but making such a forecast will not be as difficult as it seems with all the data available. However, this problem is not only facing domestic municipalities and has been resolved on a global scale. Some methods allow making quite reliable forecasts of the population for a period not exceeding 20

years based on a combination of extrapolation and cohort-component approaches (e.g., the Hamilton-Perry method and its modifications). In the USSR, there were also good practices that allowed forecasting the number of small populations (e.g., see [33, Bronshtein I.P.]). However, this experience is not currently considered. Some schemes use formulas developed based on financial discounting methods (e.g., in the scheme of Uritsky municipal district<sup>19</sup> Orel Oblast). If the developer has a clear idea of demographic trends, their use for small periods is also acceptable since such formulas allow them to work with the age-sex structure of the population. In this example, the population is projected to double in 10 years. The likelihood of such a situation in the innovative variant of the development of the municipality is low, even considering the possible migration inflow.

We have already said about the importance of the age structure for the analysis of demographic dynamics. However, such information is provided even less frequently in the forecasts. Even for the enlarged social and economic groups, the information is given only occasionally (e.g., in the schemes of Beloyarsky, Bodaybinsky, Knyazhpogostsky, Kondopozhsky, and Nadymsky municipal districts), but mainly the entire population is considered. Arguments in favor of the need to bring a complete age structure have already been given. In some cases, the developers of the schemes provide predicted data on the number of children in preschool and school ages (the schemes of the Nogliksky and Srednekansky urban districts). Still, information is provided for only three years, which does not show its dynamics.

When working with forecasts, some uncertainty is added, which means that it is easier to work with the whole population since it is easier to give a reliable estimate. However, analysis of the age structure is still necessary at least at the level of the municipal district since age characteristics determine what and where to build. If we mean to reduce the uncertainty, it is necessary to put adequate hypotheses in the forecast, because the choice of a hypothesis has a significant influence on the obtained results, and to develop several forecast scenarios.

Hypotheses for most forecasts are generally presented and substantiated, which allows us to assume the inclusion of demographic trends. However, this is not always the case: e.g., there may be assumptions about a zero-migration outflow, although, before that, it was quite large (the scheme of the Parabelsky municipal district). In the Extreme North, the absence of migration movement contradicts current trends.

Another important drawback is that the forecast calculation methodology is presented only in the schemes of Beloyarsky and Verkhnebureinsky municipal districts. In other cases, one must guess about the methods used for making forecasts.

The section on population forecasting needs to be strengthened to improve its quality. First, it is necessary to add forecast values for a more significant number of years, as well as data

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<sup>19</sup> Materialy po obosnovaniyu skhemy territorial'nogo planirovaniya Munitsipal'nogo rayona Uritskiy Orlovskoy oblasti [Materials on the substantiation of the territorial planning scheme of the Uritsky Municipal District of the Orel Region]. URL: <http://urickiy.ru/files/archit/stp-ur-pz-1.doc> (accessed 12.02.2020).

on the age structure of the population. Of the schemes that can be recommended with different reservations, the schemes of the Beloyarsky and Kondopozhsky municipal districts should be distinguished. The weakest are the schemes of Muysky, Neryungrinsky, Severo-Yeniseysky municipal districts, Todzhinsky kozhuun. Of particular note is the scheme of the Bilibinsky municipal district of Chukotka Autonomous Okrug, in which the entire population forecast takes less than a page. Such a presentation does not allow us to understand what work was carried out on forecasting.

### *Analysis of education system development trends in territorial planning schemes*

General education and additional education for children are presented in all territorial planning schemes. If higher education is provided on the territory of the municipality, the vocational institutions are also considered.

Extraordinarily little is said about the radius of accessibility of education institutions. Such information is presented, e.g., in the schemes of Severo-Yeniseyskiy municipal district and Noglikovsky urban district, and a simple mention is in the scheme of the Penzhinsky municipal district. Even though they are rarely performed at present, such information is necessary because it gives an overview of some problems in the development of the education system.

Most territorial planning schemes show the distribution of education institutions by settlements. Still, there are examples in which the number of institutions is given without such a distribution (schemes of the Verkhnebureinsky, Kondopozhsky, Lensky, Muysky, and Severo-Yeniseysky municipal districts). Generalizing indicators do not allow us to assess the population's need for educational institutions in a settlement and to plan their development, especially if we consider that the prognostic section of a scheme is usually rather weak.

Since there is usually no information on the number of children in the demographic section, these data can be presented in the section on education (e.g., in the schemes of Bilibinsky, Knyazhpogostsky, Kondopozhsky, Parabelsky municipal districts, Noglikovsky urban district), but there are weak spots. E.g., the scheme of the Srednekansky urban district shows the total number of children, the number of children attending preschool institutions, and the number of children attending schools. However, the number of children who do not attend education institutions is given in general without separation of age groups. As a result, we cannot calculate the coverage of children by the education system by its levels, and we do not know in which age group the share of children not attending education institutions is higher.

The documents show the number of children attending educational institutions, the actual and project occupancy of institutions. Still, often there is no data on the coverage of children by the network of education institutions (such data are only available in the schemes of the Verkhnebureinsky, Knyazhpogostsky, and Kondopozhsky municipal districts). It does not allow us to understand whether children do not attend institutions (primarily preschool ones) because of lack of places or parents do not want to send children there, because data on occupancy show only the load on education institutions and staff. Also, indicators such as the lineup of children for a place

in an educational institution are rather rarely cited (the absence of a line is mentioned in the schemes of the Neryungrinsky municipal district, the Nogliksky, and Srednekansky urban districts). Data on the lack of places for children already attending education institutions can be obtained from available information.

The horizon of consideration of the network of education institutions is small. Two to three years, and even more so one year, is not enough to reveal trends and conduct an analysis since the dynamics of changes in the number of educational institutions and places in the education system are not shown. Even the available data are not always presented in detail. Nevertheless, the dynamics is given for enough years in the scheme of the Verkhnebureinsky municipal district.

An essential characteristic of the network of education institutions is the technical condition of buildings since the construction time for new ones depends on this. Most documents do not provide this information. Nevertheless, this information is presented in the schemes of Beloyarsky, Verkhnebureinsky, Nadymsky, Penzhinsky municipal districts, and Todzhinsky kozhuun, which makes the forecast of the development of the network of education institutions more reasonable.

Information on additional education of children is provided quite fully. Data on the number of institutions and children attending them, their location and type of activity, as well as security standards, are considered. Concerning this section, we have a few complaints, but the significance of this element of the education system is lower in comparison with general education. Vocational education institutions exist in the few municipalities out of those examined. They are not subordinate to municipal authorities, it is not necessary to attend them, and it is possible to do this in another municipal district, the needs of the local economy do not always cause their creation. Therefore, they are considered briefly but quite adequate. However, data on the number of relevant age groups of the municipality are not considered. The indicators of boarding education institutions are considered briefly, but given the noted disadvantages, provide enough information.

The analysis of trends is not presented in all schemes. Where it exists, its quality is not always high, since there is no dynamics in the indicators characterizing the development of the education system, it is rarely said about the differences within municipalities, which are associated with an excess of places in rural areas and shortages urban ones (e.g., in the schemes of the Verkhnebureinsky and Penzhinsky municipal districts) and it is often very difficult to compose a holistic picture of the ongoing processes. In our opinion, the schemes of the Bilibinsky and Bodaybinsky municipal districts are of the least quality, and the schemes of the Verkhnebureinsky and Penzhinsky municipal districts are the best. The schemes of the Nadymsky and Neryungrinsky municipal districts are also of high enough quality to highlight them.

#### ***Forecast of the development of the education system in territorial planning schemes***

As with the use of demographic indicators, the forecast for the development of a network of education institutions is presented worse than an analysis of the current situation. It is partly

due to an insufficient level of demographic forecasting. However, there are problems inherent only in the educational section of a scheme. A brief analysis of the dynamics means that the proposals for the development of a network of education institutions are poorly justified, and it is not clear to the outside reader based on which it is necessary to have exactly as many places as planned by a certain date in a given municipal district or settlement. Unpublished calculations may be used in work. Still, in this case, they should be given in the materials on the justification of the draft territorial planning scheme to understand the logic of the authors.

Nevertheless, in the schemes of the Knyazhpogostsky and Kondopozhsky municipal districts, the proposals are presented and substantiated well enough to be recommended as positive examples. Some provisions are also well represented in the schemes of the Bodaybinsky, Lensky, and Penzhinsky municipal districts.

In the territorial planning schemes, the projects for the development of the education system are presented in a very general way: only how many places in education institutions are indicated by the levels of the education system should be in the municipal district by a certain time without highlighting specific settlements. Sometimes this is reasonable, but if there is a city or urban-type settlement in the area, then at least it should be allocated separately. For settlements, plans are presented, e.g., in schemes of the Beloyarsky, Bodaybinsky, Knyazhpogostsky, Lensky, and Nadymsky municipal districts.

Often, instead of the predicted number of children, following Construction norms and specifications 2.07.01-89 and Urban development. Urban and rural planning and development 42.13330.2011, planned standards are used (number of places per 1,000 population). Under the conditions of a demographic wave and a decrease in the share of children in the entire population, this indicator may be a false reference point that does not reflect the real situation, since it depends on the dynamics of the age structure of the population and does not always allow taking into account the actual number of children in the municipality. It is necessary to use data on the actual number of children, for which it is necessary to make appropriate forecasts of the population by certain age groups, or it is mandatory to indicate how many children per 1,000 inhabitants are planned. It will allow a more accurate assessment of the need for places and predict the development of a network of education institutions. However, the standards are used even in the section devoted to the analysis of the current situation, so we cannot hope that such information will appear in the section dedicated to the forecast. If we approach the problem more broadly, then it is necessary to assess how existing urban planning standards correspond to the current sex-age structure of the population.

The plans list the needs for places in educational institutions for certain dates, but it is unknown how many places need to be between them. If we take into account possible significant fluctuations in the number of children, then the need for a more frequent display of information becomes obvious, as well as the development in case of a significant deviation of the actual number of children from the planned one, which is not found in any scheme. Nevertheless, in more

detailed schemes, the need for the development of public-private partnerships, the implementation of educational services not only in educational institutions but also, e.g., in clubs or libraries, as well as the introduction of similar measures that partly take demographic dynamics into account, may be noted.

### *Recommendations for improving territorial planning schemes*

The analysis of territorial planning schemes showed that the indicators characterizing the development of the education system at the municipal level are not presented to a sufficient extent to enable one to draw conclusions about the past and the prospects for its development. The same can be said about demographic indicators, which testifies to the low quality of the scheme substantiation.

It is worth noting some important recommendations regarding the development of development programs and territorial planning schemes, which are often not considered. This list is not complete. It presents only those that address the issues discussed in the article.

The targets of any education development program depend not only on the financial capabilities of the regions and municipalities but also on the size of the population. In this regard, we believe that they should contain information about the dynamics of the population and the prospects for its change. It does not have to be presented in the main text, but at least in the appendix, the size of the corresponding age groups of the population and the prospects for their change should be reflected. It is necessary to provide such information for one-year age groups (it is possible doing by sex-age groups) since five-year groups do not allow assessing the need for the education system in places, buildings, and workers. Only groups for the ages of preschool, school and vocational education can be presented separately, however, to justify the scheme, one needs to know the number of older age groups, which still requires the compilation of full-fledged population movement tables.

The step of displaying data should be no more than two to three years, but it is better to give annual dynamics. More considerable periods do not allow to quickly track changes, e.g., when a decrease in the size of a population group is replaced by a stable state or growth. The depth of data should be at least ten years for the retrospective and at least 10-15 years for the perspective. 25 years (the length of one demographic generation [34, Nikitenko V.V.]) is a sufficient period for demographic trends to be fully disclosed.

The population forecast should be multivariate. At least three scenarios should be presented: e.g., favorable, unfavorable, and probable. As an alternative to the cohort-component method, the developer can use techniques in which confidence intervals for the population are presented, e.g., for a significance level of 66%, since 95% of the interval will give too large a spread of probable values and this forecast cannot be used in the practical work of management territory. However, these techniques do not always allow working with one-year age groups, so the cohort-component method looks preferable and easier to use. Predicted values in tabular form are more

informative. In the absence of volume in the document, data can also be presented in graphical form. It will be better than if the forecast is given only for specific dates with a large interval between them.

At the end of the period, the territorial planning scheme is evaluated in terms of the results achieved, and then a new one is developed on its basis. However, the approved scheme should not be a dogma. In the case of significant deviations from the predicted values, e.g., there was a sharp change in the number of children due to accession of the territory or large emigration, not only financial indicators but also indicators of the number of children, as well as the number of education institutions, which should be in the system by a certain date should be adjusted. Probably they must develop a new scheme.

Before starting work on territorial planning schemes, an analysis of existing documents should be carried out. There are two reasons for this. Firstly, the document being developed should correspond to the development goals of a specific territory; that is, it should consider local features that can make significant adjustments to the standard document. Secondly, the document being developed should not contradict both documents of its level and documents of a higher level. Otherwise, the development goals will differ, and the quality of education management will decrease.

In order to determine development goals when developing a document, it is necessary to assess various risks, identify weaknesses and strengths (e.g., as part of a reasonably often used SWOT analysis) that should be taken into account. It will make it possible to understand what results more clearly are planned to be obtained, and what should be done for this, that is, to coordinate goals, methods, and means, as well as allocated resources. Finally, a similar procedure will help to evaluate how planned indicators are achievable, considering the allocated financial resources and the projected realities of the surrounding life.

If we consider the level of general education and additional education for schoolchildren, then, of course, local authorities are more responsible for it. However, to solve the problems of providing professional education, it should be borne in mind that some of these tasks can be transferred to other regions (including those outside the Extreme North), in which there are specialists with the necessary competencies, or vice versa, requests for solving such problems. Tasks may come from other regions, and it is needed to establish interregional cooperation. It means that in educational development programs, attention must be paid to the issues of educational migration and the development of mechanisms to bring back those who leave to study outside the region. There is educational migration, and a significant part of youth is involved in it, this cannot be denied. Therefore, it is necessary to have mechanisms for its regulation. This issue is essential for the municipal level since, after graduation, very few people plan to return home to small settlements [1, Sinitsa A.L., pp. 38–39]. Therefore, the schemes should consider the possibility of significant fluctuations in the population at some ages, which are associated with the acquisition of professional education.

When developing education development programs, one should not chase quantitative indicators. Quality indicators are also important. E.g., significant graduation of students from a university is usually considered a positive phenomenon, since higher education, which is involved in the formation of personality, has value. However, if graduates do not work in their specialty, this fact is no longer so positive since considerable funds are used for nothing, fulfilling only social goals: to engage young people, distract them from the streets and illegal actions, socialize them, and so on. In conditions of an aging population and a shortage of workers with primary and secondary vocational education, which in the conditions of the Extreme North require more than the national average, territorial planning schemes should more clearly take into account the needs of the economy for personnel of different qualifications.

Education development programs require a section on linking graduation plans with vocational education institutions with the needs of the regional and local economies, since the territorial planning schemes at both the regional and local levels take into account the qualitative composition of the workforce. Accordingly, it is necessary to consider the schemes of how many human resources of the required qualifications and specialties the education system will provide, and how much must be attracted from outside. This issue is mostly the responsibility of the regional authorities, as they have a complete picture than the municipal authorities. Still, indicators of different levels should be agreed upon, and local authorities should also be involved in this process since they better know the features of their territory and its economic development.

When developing sections on the population for territorial planning schemes, it is necessary to involve a demographer or economic geographer with a specialization in demography. An analysis of the documents shows that this requirement is mandatory since, at present, the relevant sections are often poorly developed. The specialist not only knows what needs to be captured and how to do it, but he can reasonably prove why this section is important for making plans, and thus increase the quality of the document and its managerial potential.

A unified database of indicators and decisions is required to increase the degree of consistency of documents. If Rosstat generally copes with the first, then the second has not yet been done, although this has been talked about for many years. As a result, documents in one region may have discrepancies, even those accepted with a difference of several days. Such a base can become one of the elements of a mechanism for systematic diagnosis of decisions made and their integration at the regional and municipal levels. It can also be used in the scientific support of the development of the education system of the Extreme North regions.

To improve the quality of municipal territorial planning schemes, it is also possible to recommend the creation of a standard territorial planning scheme of a municipality. It should present indicators and sections that must be reflected, the most suitable methods for assessing the current state and forecasting socio-economic development, present minimal requirements for developers, and disclose other similar aspects. Developers will only have to adapt it, considering local specifics.

Finally, it is necessary to increase the competence of the heads of municipal districts and officials. V.L. Makarov wrote about this back in 2007 and made his proposals [5]. It will allow them to evaluate the approved documents better and improve the quality of management at the municipal level.

### *Acknowledgments and Funding*

This work was prepared as part of the RFBR grant No. 19-010-00867 A “Education system in the High North regions: current status, problems, and prospects of development and modernization”.

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*Received on February 12, 2020*