The Baikal region: economic specialization

N A Ippolitova¹,² and N V Rogovskaya¹,²
¹ Pedagogical Institute of Irkutsk State University, Irkutsk, Russia
² Sochava Institute of Geography SB RAS, Irkutsk, Russia

E-mail: nina-ip@list.ru, rogovskayan@inbox.ru

Abstract. The article presents the economic specialization of the Baikal region, which includes three constituent entities of the Russian Federation: Irkutsk oblast, the Republic of Buryatia and Zabaikalskii krai, which are united by the basin of Lake Baikal - a world natural heritage site. The problem of examining economic specialization is currently very relevant, which is explained by the need to increase the level of socio-economic development of the country and its individual territories, the efficiency of production and regional specialization. We analyzed the economic complex of the Baikal region, revealed its determining factors and the branches of industrial and agricultural specialization. Peculiarities of economic and geographical location, natural resource potential and natural and climatic conditions define the development of the economic complex of the Baikal region. All these factors determined the economy orientation to the development of extractive industries and industries related to their service. In recent years, this trend is reinforced. Agriculture in the Baikal region develops in extreme natural conditions: reduced biological activity, a significant part of which is characterized by low indicators of efficiency and production intensity. Agriculture in the Baikal region includes two main industries - animal husbandry and crop production, their shares in the gross agricultural output of Irkutsk oblast are approximately equal; but in Zabaikalskii krai and the Republic of Buryatia, the leading agricultural industry is animal husbandry and its share is over 70%. The cultivation of grain and vegetable crops also plays a significant role in creating a local food facility.

1. Introduction

The Baikal region is located in Siberia and the Far East and belongs to the large macro-region of Northeast Asia. The Baikal region includes three constituent entities of the Russian Federation, consolidated by the basin of Lake Baikal - a phenomenon of global importance.

The modern economic specialization of the entities of the Baikal region was established under the influence of several factors, with the leading positions of the natural resource potential, economic and geographical position, features of historical development and socio-economic prerequisites. A common feature for them is the presence of significant reserves of mineral and forest resources, relatively small population, with its uneven distribution in the territory, predominance of extractive industries in the economic complex of the entities of the Baikal region. Therefore, the economy of the Baikal region is focused mainly on the extraction of raw materials and its primary processing. Two-thirds of the region's...
industrial production is exported to other regions of Russia and the CIS countries, up to 80% of consumed industrial products are imported from other regions. The natural conditions for the agriculture development in the region are predominantly extreme: bioclimatic potential of the agricultural zone is 2–2.5 times lower than in the European part of Russia. Therefore, incomparably high energy costs are required here to obtain one unit of agricultural products.

On the nationwide scale, agriculture in the Baikal region has a modest place - less than 1% of agricultural production. In the East Siberian economic region Irkutsk oblast ranks second in agricultural production after the Krasnoyarsk krai; the Republic of Buryatia and Zabaikalskii krai - respectively 3rd and 4th places. [1-3]. All these factors define the economic specialization of the Baikal region, which vary enormously on account of a wide range of factors.

2. Models and methods
Study of the sectoral specialization of individual regions is irrelevant to the most important problems of economic development of scientific importance.

Such an integrated approach makes it possible to identify competitive areas and areas of their specialization, to form a regional policy for further development.

In international practice, indicators and methods of their calculation are used to determine specialization. Among the most common are the localization coefficient (Hoover-Balassa coefficient), Hoover's specialization index [3]. Numerous indices can be noted among the methods for allocating regions - Gini, Khachman, etc [4].

In Russian geography a wide range of methods is used in scientific research of the economic specialization of individual territories, and the leading place belongs to the system analysis [6,7]. Certain aspects of the structure of the economy, factors of balanced development of the economy and their transformation by region were considered by Tikunov V.S., Bezrukov L.A., Kuznetsova O.V. and Baklanov P.Ya. [8-11].

Specialization is considered relative to the region, when some types of production dominate in the region, or industrial production is uniformly diversified.

Analysis of the territorial organization of the economy involves the use of economic and statistical methods. The comparative method of studying economic and geographical phenomena, their specification and generalization is of great importance.

3. Results and discussion
All three constituent entities of the Russian Federation have an average level of economic development and are significantly differentiated both by the area of the territory, population and population of the territory, and by economic indicators (table 1).

| Entity                  | Territory area (thou km²) | Population (thou people) | Population density (people / km²) | Ratio of urban and rural population (%) | GRP (mil RUB, for 2018) | Share of the region's GRP from Russia GDP (%) |
|-------------------------|---------------------------|--------------------------|-----------------------------------|----------------------------------------|------------------------|---------------------------------------------|
| Irkutsk oblast          | 767.9                     | 2391.1                   | 3.09                              | 78.07/21.03                           | 1360000               | 1.6                                         |
| Republic of Buryatia    | 351.3                     | 985.9                    | 2.81                              | 59.23/40.77                           | 226100                | 0.26                                        |
| Zabaikalskii krai      | 431.5                     | 1059.7                   | 2.45                              | 68.18/31.82                           | 326865.7              | 0.38                                        |
In the economy of Irkutsk oblast and Zabaikalskii krai the main share in the GRP belongs to the extractive industry (31.5% and 15%, respectively), in the Republic of Buryatia to the manufacturing industry (9.9%), agriculture is important in Buryatia and Transbaikalia – 4.6 and 5.2%, respectively, in Irkutsk oblast it accounts for only 4.8%.

The industry of the Baikal region uses its own natural resources, and in the territorial division of labour, the region has international, national and local significance. Among the regions of Baikal Irkutsk oblast is the most economically developed, where there is a high level of concentration of production, which is directly related to the available raw material base and a unique combination of fuel and energy resources, the importance of which has significantly increased in connection with the industrial development of oil and gas resources. The fuel and energy complex is the basis for the development of regional industry; it provides the operation of the aluminum, chemical, oil refining and pulp and paper industries [12]. The presence of large timber resource base ensured the development of the wood processing and pulp and paper industries. Extractive industries include the extraction of gold, coal, iron ore, salt, gypsum, oil and natural gas.

The economic complex of Buryatia has industrial and agrarian specialization, since it has a significantly lower production potential compared to the Irkutsk region. The most developed industries in Buryatia are mechanical engineering (production of helicopters and instruments), light industry, pulp and paper industry and production of building materials. In addition, timber is harvested, gold, limestone, quartzite, coal, as well as semi-precious stones (jade) are mined. Since the end of the 1990s, the region's industry has been oriented towards export. Aluminum, forestry products (cellulose), oil products, plastics and other chemical products, products of an electrolysis and chemical plant and silicon are mostly exported.

Zabaikalskii krai stands out among the considered subjects of the region by the lowest indicators of economic activity, the increased importance of the extractive sector of the economy, and the high importance of the food industry in the structure of processing industries. The basis of the mining industry is made up of enterprises that extract uranium, gold, coal, fluorspar, and tungsten. The food industry is developed in all federal subjects located in the Baikal region.

The modern economic type of the Baikal region can be characterized as industrial-mining with the development of industrial infrastructure and processing industries, serving extractive industries and transport and logistics functions. The largest industrial centres are located in cities where manufacturing industries of various industries are represented (Irkutsk, Angarsk, Bratsk, Ulan-Ude and Chita). In sparsely populated cities the industry is represented by one or two branches, as a rule, focused on the primary processing of raw materials (Ust-Ilimsk, Sayansk, Krasnokamensk, Borzya, etc.). Extractive industries, located in places of mineral raw extraction, are represented by workers' settlements or temporary settlements (rotational camp). The latter are becoming the most widespread at the present time.

At the moment, industrial communications between industrial enterprises of the Irkutsk Region, the Republic of Buryatia, and the Trans-Baikal Territory are not sufficiently developed. The most significant component of the industrial communications of the Irkutsk region and the Trans-Baikal Territory is the supply of raw materials from the Krasnokamensk Mining Plant to the electrolysis and chemical plant in Angarsk. Electricity is supplied from the region to the Trans-Baikal section of BAM, and ore from the Chineyskoye deposit is enriched at the Korshunovsky Mining Plant.

In modern conditions, the directions and priorities for the development of industry in the country and its individual regions are determined mainly by the interests of big business, since it implements the bulk of investment projects, especially those related to the development of new deposits.

Agriculture of the Baikal region develops in unfavourable agro-climatic conditions for the widespread development of plant growing industries, the agricultural territory belongs mainly to the area of low biological activity, and a significant part of it is characterized by a cold climate. The bioclimatic potential
of the agricultural zone is 2-2.5 times lower than in the European part of Russia. Thus, more energy is required to obtain a unit of agricultural production in the region. Agriculture of the Baikal region includes two main industries – livestock and crop production, their shares in the gross agricultural output of the Irkutsk region are approximately equal. In Zabaikalskii krai and the Republic of Buryatia the leading branch of agriculture is animal husbandry, the share of production of which is over 70%.

Leading industrial sector in the region's specialization of both public sector enterprises and farms in the Baikal region is meat and dairy cattle breeding. The cultivation of grain and vegetable crops also plays a significant role in creating a local food facility. Some farms keep reindeer herds. The bulk of livestock products (in some regions, the share reaches 80–90%), as well as potatoes and vegetables in the region are produced by private sector, including farms and households. Commercial agricultural production is concentrated in the Baikal region, mainly in the forest-steppe regions adjacent to the Transsiberian Railway. In the northern regions it is of a consumer nature and is represented by patchy non-marketable meat and dairy cattle breeding and the cultivation of vegetables and potatoes [1, 2].

Based on farming specifics and aggregate industrial output, the following main types of agricultural specialization of the Baikal region can be distinguished:

- High-intensity production of dairy and dairy-meat cattle breeding, swine husbandry, potato and vegetable farming, which is formed near large cities, urban and industrial agglomerations;
- Grain and leguminous crop production, dairy and meat livestock, swine husbandry;
- Meat and dairy cattle breeding and horse herd farming, dual-purpose sheep breeding, with the cultivation of grain and fodder crops;
- Beef cattle breeding and horse herd breeding, patchy grain and vegetable crops;
- Agriculture, represented by private subsidiary plots in combination with hunting and forestry.

4. Conclusion

More recently, the economic specialization of the entities of the Baikal region has undergone significant changes, especially in industry. Nevertheless, Irkutsk oblast has the most diversified structure of economy. Almost all industries are represented in its structure, which are concentrated in its industrial centres. The least diversified structure of the economy is typical for the Republic of Buryatia and Zabaikalskii krai. In all constituent entities of the Baikal region, there is a shift towards resource and raw materials specialization (growth in the mining sector), which is confirmed by an increase in investments in extractive industries (in Irkutsk oblast in 2018, investments in the extractive industries doubled). Practically all large investment projects are focused on the extraction of raw materials, with their subsequent export (development of the Udokan copper deposit and the Kovykta gas condensate field). There are also territorial shifts to more distant (peripheral) territories. This tendency is typical for all subjects of the Baikal region.

The remoteness of the Baikal region from large consumer markets (3-5 thousand km) reduces the competitiveness of manufactured products relative to other markets. Natural resources are one of the priority factors of the competitiveness of the territory of the Baikal region; on the other hand, it is the reason why the region fell into the “raw material trap”. Since the prospects for development (forces and means) will be associated with the tasks of developing new deposits, the raw materials of which are in demand on the world market. This trend is now typical for the Irkutsk region and the Trans-Baikal Territory. The development of the manufacturing industry, the production of high-tech products of high value added will not be developed, which in general will negatively affect the socio-economic development of the territory.

The importance of agriculture in the entities of the Baikal region is different. Agriculture plays the secondary role in the economy of Irkutsk oblast. Its purpose is to meet the needs of local population for agricultural products. In Zabaikalskii krai and the Republic of Buryatia agriculture is one of the leading
industries that play a key role in the livelihoods of population. The industry gives about 8.1% of the gross regional product of Irkutsk oblast, 12% in Zabaikalskii krai and 11.5% in the Republic of Buryatia. Based on farming specifics and aggregate industrial output, the following main types of agricultural specialization of the Baikal region were identified.

Acknowledgements
The research was carried out at the expense of the state assignment (No. of state registration of the topic: AAAA-A19-119122490007-4; AAAA-A19-119080700040-8) and at the expense of the Russian Foundation for Basic Research and MECSS, project No. 20-55-44023.

References
[1] Rogovskaya N V and Filippov R V 2014 Agricultural production and food security in the regions of Siberia Internet Journal of Science 3 50EVN314 Income accessed online on 9 August 2020 via https://naukovedenie.ru/PDF/50EVN314.pdf
[2] Geography of Siberia at the Beginning of the 21st Century 2016 vol 6 ed V M Plyusnin (Novosibirsk: Academic publishing house Geo) p 396
[3] Kim S 1995 Expansion of markets and the geographic distribution of economic activities: the trends in U.S. regional manufacturing structure, 1860-1987 The Quarterly Journal of Economics 110(4) 881-907
[4] Sharma R K 2008 Measuring Economic Diversification in Hawaii (Honolulu: Government of Hawaii) Income accessed online on 11 August 2020 via http://files.hawaii.gov/dbedt/economic/data_reports/EconDiversification/Economic_Diversification_Report_Final%203-7-08.pdf
[5] Statistical Collection Agriculture, Hunting and Forestry in the Irkutsk Region in 2018 2019 (Irkutsk: Statistical collection Irkutskstat) p 61
[6] Nikitina M G, Shutaeva E A and Pobirchenko V V 2016 Systemic-genetic approach in the study of the process of social organization of the territory Theory and Practice of Social Development 10 68-72
[7] Lazhentsev V N 2013 Territorial development as an economic and geographical activity (theory, methodology, practice) Regional Economy 1 10-20
[8] Tikunov V S and Chereshnya O Yu 2015 Index of economic development of regions of the Russian Federation Vestnik Mosk. un-ta Ser. Geography 6 41-7
[9] Bezrukov L A 2008 Continental-Oceanic Dichotomy in International and Regional Development (Novosibirsk: Academic publishing house Geo) p 369
[10] Kuznetsova O V 2014 Typology of factors of socio-economic development of regions of Russia Vestnik Mosk. un-ta Ser. 5 Geography 2 3-8
[11] Baklanov P Ya 2007 Territorial Structures of the Economy in Regional Management (Moscow: Nauka) p 239
[12] Tarakanov M A 2018 Problems of final consumption products in the industry of the Irkutsk region Geography and Natural Resources 2 137-44