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**GEOGRAPHIC MODELING OF ECONOMIC DIVERSIFICATION
IN A RAW MATERIAL PRODUCTION REGION
(THE CASE OF KHANTY-MANSI AUTONOMOUS AREA-YUGRA)**

SUMMARY. Khanty-Mansi Autonomous Area-Yugra is used as a test region to employ a variety of economic and geographic tools to diversify the economy of a raw material production region. The article describes the ways of geographic modelling aimed at balanced social and economic development of the territory. It also defines the basic concepts underlying the model, which are necessary to select criteria metric; it describes the current economic and geographic status of the territory; the social and economic issues that hamper balanced development of the autonomous area; the areas of geographic modelling; the socio-economic effect to follow the introduction of geographic modelling. The research results can be used in scientific and practical activities to carry out socio-economic reforms at both regional and local scale aimed to reduce the dependence of the region on the raw materials production industry such as: the regional economy, the territorial organization of population, electronic cartography, the automated control systems. The main conclusions are aimed at a comprehensive study of the territory potential, the account of natural resources and human potential as a base of strategic planning and forecasting in the system of information support for administrative decisions.

KEY WORDS. Geographic modelling, diversification, raw material production region.

Most of Russian specialised forums and policy papers that set up priorities for economic development focus on diversification of national economy. Russia, being dependent on fluctuations of world oil and gas prices that are set at stock exchanges beyond its control, cannot plan well-balanced social and economic development, described in the Concept of long-term social and economic development in the Russian Federation till 2020 [1]. The demand for raw materials is defined as secondary, i.e. dependant on the demand for goods produced from it.

The structure of basic documents in the list of macroeconomic indicators is headed by the world oil prices forecast (for example, Appendix 1 of the Concept). This confirms that the strategists are committed to the conditions of the oil and gas market. But, despite the discrepancies between the forecast indicators and reality (Table 1), and although oil prices have long ceased to reflect the supply and demand ration for particular goods, they continue to set the pitch in the Russian economic modelling.

At the same time the Concept contains no maps that would reflect the regional differentiation of social and economic conditions; it does not specify who is in charge of enforcing the Concept; there are neither directions, nor measures. Similarly, finance resources

are not specified that would make it possible to meet these guidelines. For example, the territories with adverse ecological conditions show the decrease in population number: from 43% in 2007 to the projected 14% in 2020, but the Concept disregards this trend.

Table 1

Forecast macroeconomic indicators [1]

	2007	2008– 2010	2011– 2015	2016– 2020
(World) Oil Prices, US dollars per barrel	69.3	99.0	91.0	108
Oil Production, mln tons	490.9	499.7	524.0	533
Gas Production, billion cubic meter	651.5	697.3	763.8	848
Oil Exports, mln tons	258.4	255.0	261.4	263
Gas Exports, billion cubic meter	191.9	213.7	254.8	303
Electricity Rates: growth of government-managed electricity rates for the public for the period	113	178	242	137
Natural Gas Rates, growth of the public average wholesale price	115	203.1	356	121

To diversify the economy of a multicultural state, which spreads over a number of natural environmental zones, it is important to resort to geographic tools and to model the implementation of the measures planned. Recent history has seen a number of administrative mistakes, which prove the importance of integrated geographic approach for the economic activities. For example, in the 1990s the reforms were largely based on the principles of the Washington Consensus formulated in 1989 at the World Bank and International Monetary Fund Conference. They were meant for the developing Latin America countries [3]. The reforms of the 1990s did not follow a certain model or plan of social and economic transformations [4].

This work aims at defining the major lines of activity to design a geographic model that would help to attain the goal of a well-balanced economic diversification in a raw material production region such as Khanty-Mansi Autonomous Area-Yugra.

To achieve this aim we will undertake the following tasks:

- to define the basic concepts underlying the model, which are necessary to select the criteria metric;
- to describe the current economic and geographical status of the territory;
- to reveal social and economic issues that hamper the balanced development of the autonomous area;
- to define lines of activity for geographic modelling;

— to determine the socio-economic effect to follow the introduction of geographical modelling.

This research is based on the concepts of *diversification*, *modelling* and *raw material production region*, that define its priorities and results. Their definitions are exhaustively detailed in the Soviet social and economic geography [5]. *Diversification* (the opposite of simplification) is a process towards greater complexity of the component structure of a geographic unit. The latter is defined as a geoterritorially integral (i.e. continuous) unity, a cluster of some objects or their properties at a land or water surface that distinguish this territory from others and that come to being as a result of certain processes. Thus, we have a geographically defined subject-matter of the research, i.e. a geographic unit with a status of a raw material production region of the Russian Federation. The concept of *raw material production region* is based on the make-up of gross regional product that has the raw material production category prevailing over all else.

Diversification of economy (we correlate this term with the term “economy” that was widely used by Soviet economic geographers) is a process which leads to a more complex structure of an industry, i.e. greater variety of products and greater number of independent specialised entities (enterprises, spheres).

Another concept, basic for this research, is *modelling* that is interpreted as a process of setting up a model. *Model* (from Latin *modulus*—“forma” and “exemplar”) is a substitute that can function as the original under certain conditions, displaying hereby the properties and features of the original under study. Geographic modelling helps to make use of the necessary thematic tools, and first of all of mapping to present the managerial outcomes. By *management* we mean here a broad range of activities associated with exercising control over certain processes in line with a predetermined programme and having certain objectives. A specific function of management is made up by three actions: forecasting, programming and planning.

These concepts help us to choose the tools, to describe the expected results and to define the essence of the managerial decisions.

As regards geographic economy, the territory of the autonomous area, on the one hand, has prerequisites for the balanced social and economic development. And on the other hand it can function as a deterrent for economic diversification. As far as its location is concerned, it matters that it has no immediate access to seas, does not border on foreign countries and is away from major transport routes. Adverse natural environment undercuts the role of river transportation, which is pivotal in the period of deliveries to the Northern territories. The area has the world largest swampland ecosystems (Surgut Woodlands, Vakhovsk Woodlands, Kondinskoye Woodlands), which has a considerable negative effect on the development of the transport infrastructure and makes it really costly. The major production and logistic centres of the area are a great distance away from each other, and it requires a large fleet of aircraft, which caters for both passenger and freight services. The local *UTair* airline has become a domestic market leader with an international service.

From the demographic point of view the area is one of the few Russian Federation regions that have the natural population growth. The major factor responsible for the

positive natural growth dynamics is the gender and age characteristics of the population — the younger people prevail; at the same time the area's government social measures to support young families do have their effect. The migration dynamics is also positive, and it is mostly formed by internal population flows, primarily from the other districts of Tyumen Region, but also by immigration.

Contemporary Yugra economy is based on the energy industry, that uses the advantages of the natural resources potential (NRP) on the one hand, and developed industrial infrastructure, on the other hand.

However, as it is typical for any mining rent, mineral resources are exhaustible resources and their development under the current social and economic conditions cause loss of profit on the part of agents of alternative industries operating at the territories licensed for hydrocarbons mining. In this regard attention should be paid to the losses suffered by the traditional industries of the northern indigenous ethnic groups.

The geographic economy of the region is also characterised by the governmental policy for the development of the information infrastructure which is viewed as a precondition for effective implementation of the social policies and makes the region attractive for investors. Today Yugra is an acknowledged country leader as regards the scale of IT development and electronic services to the population. Unfavourable natural environment of the North makes the wide-spread Internet a powerful means of effective control and management, first of all in the sphere of social welfare and services.

It makes sense to represent the social and economic problems that can be defined as “detrerring the balanced development of the area” in a spatial view. This will help to specify the scope of influence as well as map out propulsive growth points.

The central problem detrerring the balanced development of this territory is not the simplification of the economy, but it being dependent on the energy industry for its economic development. This “predisposition” is reflected in the territorial strategic development programmes, the targeted programmes by individual departments, etc.

The other important problem is poor integration of the enterprises into the traditional economy and the vulnerability of the natural stows [8], which leads to the considerable conflict of interests. The territory also suffers from the lack of coordinated management in programming and planning due to the poor quality and representation of the informational coverage of the territory in terms of various types of information about it [9]. To implement the integrated planning of the territory development it is important to rely on the necessary information that would define the potential, the risks and the hedging options.

There is no arguing that the list of the problems is not limited to the ones specified above, but within the scopes of the present publication they help to single out the general problematic areas which require to employ geographic tools.

The areas for geographic modelling can be defined as follows: setting up a geographic model of the territory that specifies attributes, reflects the results expected for specific districts and represents programmes and plans based on a succession of

managerial decisions associated with some problems and specified tasks. The geographic model of the autonomous area can look like a map with a large basic scale of 1:25,000 that is equipped with the methodology and schedule for the dynamic updating of its content.

It is a fact that today there are technologies to upgrade maps, and they are developed from the traditional paper format into electronic geoinformational coverage, which enables the user to adjust assessment and planning settings. Geoinformational backup along with the institutional infrastructure is seen as an inalienable component of the territorial public system [10]. The technology of content updates has received a new momentum with the onset of the methodology of the earth remote sensing. The advantages of the space monitoring include the objective character of the assessment and dynamic results, while modern technologies of space survey can overcome the restrictions of cloudy weather. Advanced web-technologies make it possible to offer the interactive survey of the territory, which enlarges the target audience.

The basic geospatial model can be further developed to differentiate parts of the territory on the basis of the assessment of their natural resources, as well as social and economic potential. This differentiation should follow certain regulations that will delimit different priorities in the use of the territory and make this delimitation official. The differentiation should be based on zoning that is aimed at defining types of priority use of landscape resources:

- ecological framework of the territory;
- economic units in need of recultivation;
- territories that are important for the indigenous North economy (territories of traditional national resources management together with the related units providing for their stable functioning);
- territories that have a promising combination of resources and factors (for example, ample wood stock and routes of transportation, agricultural sector enterprises that produce compatible products and consumers);
- transport infrastructure, including the projected ones, that are pivotal for the development of regional communication lines;
- tourist infrastructure objects;
- underground and land communications;
- rights holders to the lands on lease.

Social and economic effects of geographic modelling can be based on the assessed efficiency of the corresponding managerial decisions. The outline of the main achievements can be forecast on the grounds of the projected functions:

- compiling a general list of the leaseholders of the lands at the territory of the autonomous area, and consequently, holding them responsible for the ecological environment and subsequent recultivation, including the options of the public examination;
- determining the ecological framework and attaching the necessary functions to it through passing corresponding legal documents;

— mapping out the territories of traditional and alternative economies, which help to conserve the unique culture of the people of the North, and mapping out the areas attractive for investors and supported by the government in terms of encouraging entrepreneurs;

— determining the prospects of infrastructure development, including those based on the integration of road and pipeline communications of the region, municipalities and economic agents;

— generating an integrated informational coverage that would show the existing and projected infrastructure and help to evaluate the synergetic possibilities of these communications as well as prevent emergencies resulting from the overlap and conflict of the old and recent objects.

Thus, attaining these results with the help of geographic modelling, helps to define the major areas of economic diversification. If they are incorporated into the regional and municipal legislature they will determine the programme and plan for the controlled diversification of the regional economy.

REFERENCES:

1. Russian Federation Long-term Socio-economic Development Policy till 2020 (appr. by RF Government Decree No. 1662-p. on 17 November 2008).
2. Osipov V.A. Social and Economic Issues of Natural Resources Management. Tyumen: Tyumen State University Publishing (1999): 248.
3. Zaitseva A.N. Global Economic Concerns and Regional Perspective. *Regional Social and Economic Issues in the Transition Period*. Tyumen: Tyumen State University Publishing (1997): 3–10.
4. Yasin E.G. The Government Role in the Market Economy. *Economic Matters № 7*. (1997): 14.
5. Alayev E.B. Social and Economic Geography: Terminological Ideographic Dictionary. Moscow: Mysl (1983): 350.
6. Meskon M.H., Albert M., Hedowry F. Management Fundamentals. Moscow: Delo (2002): 704.
7. Berlyant A.M. Cartography. Moscow: Aspect Press (2001): 336.
8. Haaren, K. Landschaftsplanung und Strategische Umweltpreuefung. Hannover: SUP (2000): 136.
9. Petrov Yu.V. Economic and Geographic Estimate of Investment Prospects of the South of Tyumen Region. *Author's Abstract of Ph.D. Thesis*. Perm (2010): 20.
10. Sharygin M.D. The Key Issues of Economic and Social Geography. Perm: Perm State University Publishing (1997): 272.