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Resource Projects in Region Economy: Experience of Assessment

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***Abstract*—Theoretical and methodical questions are investigated at identifying and quantifying systemic effects from execution resource projects. Given methodological principles are based on the key provisions of the resource economy, environmental economy, spatial economy, the theory of investment efficiency (especially investments to the social sector).Russian practice on evaluation of multipliers and systemic effects of resource projects and its location on different stages is shown.Scientific-methodical and practical task of presented research is adaptation of existing assessment resource project, realized at Russian Far East region - the construction and operation of iron ore mining and processing plant in Jewish Autonomous Region.The research performed by the authors allows to obtain new knowledge and methodological advances at assessment systemic effects of resource projects and its location on regional level.**

***Keywords*—Resource projects, multiplicative effects, direct and indirect effects, resource region, Russian Far East.**

I. Introduction

Questions of investigation and quantifying systemic effects of resource projects are discussed at a lot of Russian and foreign scientific research works. Special value is in problem of regions enriched mineral resources that usage is forming economic specialization of territory. Most Far East regions in Russia are resource regions. At the Far East almost all Russian resources are concentrated: up to 100% of diamond production, 92% resource and 100% tin mining, 33% resource and 45% gold mining, 35% resource and 65% silver mining, 23% and 89% tungsten concentrate production, 50% resource and 100% the extraction of stibium. At the period of transformation, the role of Far Eastern mineral resource complex is increased in regional and national economics. At the present time some resource projects are realized in region for the formation perspective structure of regional economics. The article is devoted to the experience of assessing the systemic effects of one of these projects.

II. Relevance and Scientific Significance

The interdependence of mineral resources and economic growth [1-3], relations between extractive and processing industries [4], use of mineral resources for sustainable development of economic systems in different stages [5-7] – are always actual problems.

One of the important aspects of this research is the evaluation of the role of resource projects in economic development, methodological features of evaluating the effectiveness of such projects and its real contribution to regional development. Research questions of theoretical, methodical and practical aspects of estimation of a role of resource projects in economic development are in the subject area of a number of research directions: resource economics, environmental economics, regional economics, spatial economics [8-10], investment efficiency (especially investments to the social sector), natural rent, evaluation of multipliers of system effects of resource projects [11-19], its regional location [20-22].

The most adequate and really systematic assessment of resource projects can be evaluation of resource projects and their multiplier effects in the regional economy obtained on the basis of intersectoral models [4, 11-13]. In addition assessment of resource projects implemented on the basis of non-renewable mineral resources (not one generation's natural resources), should be corrected general approaches to their effectiveness. Methodological and methodical platform for such adjustment can be, for example, approaches and methods realized at assessment of social or community projects [8-10, 14, 19]. However, often the lack of full information about the expected resource projects does not allow to take full advantage of these classical approaches and methods. In such cases, "simulation approaches" combining quantitative and qualitative indicators are realized [6, 8, 9, 15], formation and use of background indicators to obtain estimates of the effectiveness of resource practices. Examples of such approaches are also known [5-7, 21, 22].

The scientific significance of such studies is in the adaptation of various theoretical approaches and practical implementation of methods for assessing the effectiveness of resource projects for a particular region.

III. Problem Statement

There is a great resource project - construction and operation of Kimkano-Sutarsky mining and processing plant (KSGOK) for iron ore mining and iron ore concentrate production is realized at Jewish Autonomous Region (JAR) today. The production capacity of the first stage is 10 million tons per year and 3 millions of iron ore concentrate with 65% Fe content. It is expected to increase capacity of KSGOK due to the processing of more than 7 million tons of iron ore Garinsky Deposit (Amur Region). Production of the plant is intended for internal consumption and export to the countries of East Asia, first of all, to China.

The project operator is the company IRC Ltd, a member of the group of companies "Petropavlovsk". Investments to the project are estimated at $500 million, a significant part of which ($340 million) is financed from the credit line of the Commercial and industrial Bank of China (ICBC). When the enterprise reaches full capacity, it is expected to create more than 1,500 jobs, significant tax revenues to the budgets of different levels. In addition, the construction of a railway bridge across the Amur river near Nizhne-Leninskoe (Russia) – Tongjiang (PRC) is under way. The first stage of KSGOK's operation started in 2016-2017, reaching full capacity production is planned in the first half of 2018.

To the JAR's measure, it is a major project that can significantly change the economic structure of the region and become a driver of social-economic development. Therefore, an important scientific task is to assess the effects (positive and negative) created by this project, and first of all – in the regional economy. For realization of this task it is necessary to carry out a number of methodical, information and settlement stages of works.

IV. Results Discussion

All the effects of the project can be divided into direct and indirect effects. Direct effects are generated directly by the project itself without given intersectoral links. Indirect effects arise as a result of indirect influence of the project on the socio-economic system of JAR through the impact on other projects and sectors of the region's economy. In presented research the effects induced by the project of ore mining are devided to direction, value, branch specificity, spatial localization. Regional effect of the estimated resource project depends largely on how the effects will be spatially distributed in the region and beyond.

The research studies changes in the main economic indicators in Jewish Autonomous region 2010-2017 [23, 24] and the possible impact of the beginning of the operational phase of the resource project on a number of key aspects is estimated

Assessment of the relationship between the implementation of the resource project with dynamics of key economic indicators. Usage of graphical methods for assessing and visualizing trends in the dynamics of value indicators results' activity on "mining" and the final indicator of the regional economy - the gross regional product (GRP) – revealed their coincidence in direction and growth rate.

Study of the dynamics of foreign trade turnover in Jewish Autonomous Region shows its steady decline since 2013. Since 2016 the growth of exports in the total structure of the foreign trade turnover was recorded. There is an increase of the total volume of foreign trade turnover by more than 2 times since 2017. Presumably, such a change is associated with reaching the designed capacity of the KSGOK. We carried out an econometric analysis of the relationship between the growth of gross exports and mining, so on the results we can confidently say that exports from the JAR determined by the results of the economic activities of resource companies.

Also the impact to the formation of budget revenues and dynamics of indicators of investment and construction complex of Jewish Autonomous Region by the KSGOK launch was investigated. What about the growth of budget revenues from launch of great resource project in Jewish Autonomous Region, the situation of budget deficit is not broken yet. In the "Construction" sector, the positive volume dynamics is still maintained, mainly due to the construction of the railway crossing between the Amur river in the area of Nizhne-Leninskoye (Russia) and Tongjiang (China). As for the dynamics and volume of investments, they were high during the KSGOK's construction period. In 2017, there was a significant decrease of 2-2.5 times compared to the "peak" of 2011-2012. So, the direct effect in the investment sphere has been exhausted, and the indirect one has not yet appeared.

Assessment of risk of decreasing price on production of KSGOK. It is expected that project «KSGOK» significantly change the structure of the economy of Jewish Autonomous Region. In 2017, the share of mineral production in the GRP structure was 17.1% against 2.2% in 2015. According to forecasts, the volume of production of the mining complex will amount to more than 50% industrial production of Jewish Autonomous Region, and its part in the GRP structure will be about 20%. The leading role in the economy of the region will be occupied by the resource sector, which entails significant risks associated with the volatility of world commodity prices.

We were estimated the risk of ingress of KSGOK in unfavorable pricing area due to the decline of iron ore prices on the world markets. Calculations were carried out by the method of interval estimates with confidence probability. Today costs are forecasted at $34 per tone of 65% concentrate, after completion of the construction of bridge over the Amur river - $28 per tone. Calculations have shown that the probability of falling prices below $34 is 4.5%, and below $28 - 3.1%. It means good factor of safety for the project of KSGOK in the price of its products.

V. Summary

Summing up the total results of the conducted research stage, now it is possible to determine:

- the characteristics of the resource project (KSGOK) and the possible directions of its impact on the socio-economic system of the Jewish Autonomous Region are discovered;
- the system of effects (direct and indirect) and risks that can have a significant impact on the social-economical development of the Jewish Autonomous Region is grouped;
- the analysis of social-economical indicators of JAR for the period of 2010-2017 is carried out and the assessment of interrelation of their dynamics with the beginning of operation of the large resource project is received;
- probabilistic risk assessment of the decline in world prices for products of KSGOK and the degree of sustainability of the project in a positive price zone is obtained.

It can be expected that the increasing of production of the resource project will lead to growth of multiplicative effects in the Jewish Autonomous region economy. At the same time, one of the most important research and practical task is to identify and assess the transboundary component of these

effects in connection with the dense "embedding" of the project in cooperation with China.

The study conducted by the authors allows to obtain new knowledge and methodological advances in the field of assessing the systemic effects of resource projects and their localization at the regional level. The scientific novelty consists both in the formulation of the research problem (assessment of the effects and economic consequences for the region from realization of resource projects) and in the adaptation and practical realization of various theoretical approaches and methods of its solution for a particular region (the Jewish Autonomous Region).

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