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## **Environmental and Economic Aspects of Natural Resource Use and Problems of Cross-Border Cooperation in Regions of Siberia**

*Based on extensive statistical data, the authors analyze economic development and processes of environmental change in regions of the Siberian Federal Okrug. They find considerable inequality in the distribution of economic results and the concomitant environmental load, and they assess some prospects for cross-border cooperation.*

### **Regional economic development**

The term “environmental colonialism” has been used by foreign authors since the mid-1990s. It means growing exploitation of the environment, not only withdrawal of natural resources but also pollution as a result of economic activity, including the placement of production facilities with a high environmental risk component. At present, various forms of manifestation of environmental colonialism are seen in a number of regions of Russia, not only those that specialize in natural resource extraction but also those that possess significant reserves of various resources that

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are of interest for markets in other regions or adjacent countries. Comparative analysis of the development of eastern regions of the Russian Federation in the precrisis period showed that they lag significantly behind the overall Russian level economically, while having higher parameters of negative environmental impact. There are serious fears that these regions' environmental problems may get even worse in the process of cross-border cooperation.<sup>1</sup>

Programs and strategic documents for the socioeconomic development of regions of the Siberian Federal Okrug pay a great deal of attention to questions of cross-border cooperation with China, whose economy has needed an ever larger amount of resources in recent years. The limited amount of their own natural resources predetermines the nature of joint investment projects, the greater part of which is aimed at developing Siberia's very rich natural resource potential.

At the same time, hopes placed on the development of export-oriented raw-material and related sectors of the regional economy and an increase in the population's prosperity have hardly been justified. Attempts at the level of regions of the Russian Federation to achieve the average Russian economic development indicator (per capita gross domestic product [GDP]) and a high growth rate of it that are being made indirectly at the expense of natural-resource regions not only may lead to the depletion of mineral resource reserves and exacerbation of environmental problems but also may heighten the existing interregional differentiation.<sup>2</sup>

The enormous inequality of the distribution of regional economic development indicators at present may have a negative effect not only on the efficiency of socioeconomic transformations but also on the formation of a nationwide market and equilibrium and stability in society, intensifying dangerous sociopolitical processes and leading to conflicts between various strata of society. Moreover, concentration of economic activity in major agglomerations fosters an increase in migration processes and an outflow of skilled labor resources, which are most noticeable in regions of Siberia and the Far East.

In the current conditions, opportunities to have an effective impact on the situation in the regions have decreased, in particular, because of the reduction in the regions' authority in the sphere of subsurface resource use and the redistribution of rent income from natural resources to the benefit of the center. All of this makes it necessary to strengthen the regions' role and make strategic decisions, including decisions regarding the development of environmental policy.<sup>3</sup>

### **Environmental and economic development of the Siberian Federal Okrug**

The Siberian Federal Okrug—the second largest macroregion of Russia—occupies 30 percent of its territory and includes twelve regions. Despite the concentration of significant reserves of mineral and raw material resources in the okrug's territory (85 percent of the total Russian reserves of lead and platinum, 80 percent of coal

Table 1

**Contribution of Federal Okrugs to the Environmental Load and Gross Domestic Product in 2008 (%)**

Okrug	Gross regional product	Wastewater disposal	Air pollutant emissions	Generation of production and consumption wastes
Central	37.7	16.8	7.9	5.5
Northwest	9.9	23.9	11.1	9.3
South	8.0	16.6	4.3	0.5
Volga	15.6	16.6	14.0	10.1
Ural	14.2	6.6	28.8	6.9
Siberian	10.2	16.7	29.7	57.5
Far Eastern	4.5	2.9	4.2	10.2

and molybdenum, 71 percent of nickel, 69 percent of copper, 44 percent of silver, and 40 percent of gold),<sup>4</sup> in 2008 the okrug provided just 10.2 percent of the Russian Federation's GDP. At the same time, its share in the total amount of environmental pollution is significant: 16.7 percent of the total amount of wastewaters, 29.7 percent of air pollutant emissions from stationary sources, as well as 57.5 percent of the total generation of production and consumption wastes (Table 1).

Comparative analysis of the dynamics of economic development indicators and the condition of the environment in 2000–2008 enables us to identify the following trends:

- steady growth of the Russian Federation's GDP and the Siberian Federal Okrug's gross regional product (GRP), by 61.5 percent and 61.4 percent, respectively;
- a considerable reduction in current spending on environmental protection (by 20.4 percent in the Russian Federation and 23.4 percent in the Siberian Federal Okrug), with a revival of investment processes aimed at environmental protection. However, the growth of investments in fixed capital going to environmental protection and conservation of natural resources is unstable and lags significantly behind the average value for the country (33.4 percent). The share of environmental protection investments in the total amount of investments in the Siberian Federal Okrug is negligible: 1.5 percent in 2007;<sup>5</sup>
- the amount of payments for negative environmental impact in the Siberian Federal Okrug increased by 45.9 percent; however, for the country as a whole it decreased by 5.8 percent. But the current level of payments is considerably less than the actual economic damage that occurs due to environmental pollution.<sup>6</sup>

This parameter's significant volatility may be due to an increase in the payment rates and commissioning of fixed assets for environmental purposes as well as a change in the total number of firms using natural resources;

- growth in the amount of air pollutant emissions from stationary sources, both in the Russian Federation and in regions of the Siberian Federal Okrug, by 7 percent; and
- a decline in amounts of polluted wastewater disposal, which was 15.3 percent in the Russian Federation and 10.7 percent in regions of the Siberian Federal Okrug. Nevertheless, the condition of bodies of water in Russia remains stressed: in 2007, the portion of water samples from public water supplies that do not meet the standards was 28.3 percent with respect to sanitary and chemical parameters and 20.6 percent with respect to microbiological ones.<sup>7</sup>

Thus, the period of precrisis growth of the Russian economy was accompanied by an increase in the environmental load and low interest of firms in addressing environmental protection problems. The first results of the crisis indicate a slight reduction in the level of negative impact on the natural environment. This is undoubtedly of a short-term nature, since it is primarily due to the decline in industrial production.

The crisis forced firms to reduce their production costs, which in the future may be an impetus to introduce resource-saving technologies; however, the consequence of this at present has been an appreciable decline in investments in fixed capital for environmental protection and conservation of natural resources. The imperfection of the economic mechanism for natural resource use (environmental payments do not compensate the harm that is done; indexing of the payments lags behind inflation; the intended purpose for use of the money received is lost; and the effect of accumulation of pollutants in the environment is not taken into account<sup>8</sup>) does not motivate the firms that use natural resources or the government as a whole to preserve and improve the quality of the environment.

### **Inequality of economic development and distribution of the environmental load**

As a result of reform of the Russian Federation's political and economic system with the transition to market relations, differentiation in the levels of socioeconomic development of the regions of Siberia has increased.<sup>9</sup> Along with a high level of inter-regional inequality, the Siberian Federal Okrug is also characterized by considerable unevenness in the distribution of the environmental load. For instance, in 2008 the per capita difference between the twelve regions of the Siberian Federal Okrug was:

- a factor of 16 in air pollutant emissions;
- a factor of 12,989 in generation of production and consumption wastes (2007); and
- a factor of 70 in wastewater disposal.

Table 2

**Distribution of Regions of the Siberian Federal Okrug (SFO) in Per Capita Gross Regional Product (GRP), 2008**

Type of region	Regions of the Russian Federation with per capita GRP	
	Below average for the SFO	Above average for the SFO
Border regions	Altai krai, Zabaikalsky krai, Altai Republic, Republic of Buryatia, Republic of Tyva	Novosibirsk oblast, Omsk oblast
Internal regions	Republic of Khakassia	Irkutsk oblast, Kemerovo oblast, Krasnoyarsk krai, Tomsk oblast

We should point out that at the level of the country as a whole the difference between these parameters is even greater. And “intensification of the trends of economic and social inhomogeneity of the economic space” in present-day Russia is becoming one of the most pressing regional problems.<sup>10</sup>

The difference between regions of the Siberian Federal Okrug in per capita GRP was a factor of 3.3 in 2008. Six of the regions of Siberia have per capita GRP higher than the average for the okrug (Krasnoyarsk krai, Kemerovo, Irkutsk, Omsk, Novosibirsk, and Tomsk oblasts), and only two of these are border regions (Table 2). But in spite of the fact that Zabaikalsky krai borders China, which has been developing dynamically in recent years, it lags considerably behind the most developed regions of Siberia in economic growth.

Spatial inhomogeneity in regions of the Siberian Federal Okrug is also seen with respect to the rate of economic development (in the period 2000–2008). In the greater part of the most important regions of Siberia that are the foundation of the Siberian economy (Krasnoyarsk krai, Tomsk, Kemerovo, and Irkutsk oblasts), the economic growth rate lags behind the Russian average by a factor of 1.2–2.0. It is higher than the average only in Omsk and Novosibirsk oblasts, while in Irkutsk oblast, Altai and Zabaikalsky krajs, and the Altai Republic, it corresponds to the Russian average.

In Krasnoyarsk krai, a typical raw materials region that works primarily for the foreign market, the growth of per capita GRP during the period in question was just 54 percent, which is significantly less than the Russian average (77 percent). The environmental load in this region is very high. It is in fourth place in the Russian Federation in the per capita amount of air pollutant emissions and sixth place in per capita wastewater disposal (Table 3).

A similar situation is seen in Kemerovo, Tomsk, and Irkutsk oblasts, and in other regions of the Siberian Federal Okrug. The highest economic growth rates are in Omsk (growth of per capita GRP, 112 percent) and Novosibirsk (104 percent) oblasts. It is important to point out that it is precisely in these regions where

Table 3

**Parameters of Negative Environmental Impact (per capita) and the Region's Place Among all Regions of the Russian Federation in 2008**

Region	Air pollutant emissions from stationary sources		Per capita volume of wastewater		Generation of production and consumption wastes (2007)	
	Kg/person	Place among regions of RF	M <sup>3</sup> /person	Place among regions of RF	Kg/person	Place among regions of RF
Altai krai	85.1	39	117.4	58	927.4	50
Zabaikalsky krai	125.1	26	213.1	37	74,811.9	10
Irkutsk oblast	252.2	15	461.8	21	38,934.5	15
Kemerovo oblast	532.7	6	743.5	8	614,599.6	1
Krasnoyarsk krai	850.7	4	1,005.3	6	80,713.2	9
Novosibirsk oblast	87.7	37	236.8	31	640.3	60
Omsk oblast	117.2	29	97.3	67	2,389.9	29
Altai Republic	53.1	54	14.3	81	47.3	80
Republic of Buryatia	102.5	34	631.8	11	20,976.0	18
Republic of Tyva	70.7	45	28.7	80	20,603.0	19
Republic of Khakassia	184.6	18	159.8	45	100,521.6	7
Tomsk oblast	310.1	11	485.3	17	802.5	7
Total for Russian Federation	141.7	—	366.9	—	27,693.8	—

manifestations of the economic crisis were of a moderate nature.<sup>11</sup> This was primarily because of the diversified structure of their economies and effective anticrisis regional policy measures.<sup>12</sup>

The strategic goal for the development of Siberia is for regions of the Siberian Federal Okrug to achieve the average Russian parameters of socioeconomic development and to provide comfortable living conditions,<sup>13</sup> an important component of which is a favorable environmental situation. However, interregional differentiation, which has been growing swiftly in recent years, is becoming a barrier to implementation of long-term federal and regional development programs.

Russian scholars are giving considerable attention now to questions of quantitative evaluation of the existing inequality of development of regions of the Russian Federation; however, most of their studies concentrate on the most pressing problem, income distribution. At the same time, uneven economic development of territory, which is especially characteristic of regions of Siberia, leads to differences in the level of consumption of natural capital, which are due, among other things, to the negative environmental impact of economic activity.

The results of evaluation of measures of inequality for regions of the Siberian Federal Okrug indicate the presence of considerable interregional differentiation with respect to the environmental and economic indicators that were considered. This differentiation is also characteristic of all regions of the country.<sup>14</sup> It is especially pronounced in relation to wastewater disposal per capita and per unit of territory, as well as the amount of air pollutant emissions. The most significant differences between regions are seen with respect to the generation of production and consumption wastes, per unit of territory and per capita. Here we should point out that the values of the inequality indexes calculated by the authors are significantly higher for parameters of the environmental load calculated per unit of territory than for the per capita parameters.

Based on the results set forth above, we can conclude that significant differentiation of the regions of Siberia exists not only in relation to economic development but also with respect to the degree of anthropogenic impact that occurs as a result of economic activity.

### **Zabaikalsky krai: A raw materials economy and prospects for cross-border cooperation**

Zabaikalsky krai, one of whose competitive advantages is its location on the border with China, has broad opportunities for the development of cross-border cooperation, as indicated in the Strategy for Socioeconomic Development of the Far East and the Baikal Region.<sup>15</sup> A reduction in exports of unprocessed natural raw material and diversification of the regional economy are important directions of its implementation.

However, at present the majority of joint investment projects in the krai that have been announced in the Program for Cooperation Between Regions of the Far

East and Eastern Siberia of the Russian Federation and the Northeast of China for 2009–18 involve production and primary processing of mineral raw material resources, more advanced processing of which is planned in the territory of the adjacent country.<sup>16</sup> Development of infrastructure and the service sphere as well as production facilities that create higher value added in the region do not receive proper attention. About half of the investment projects designated for implementation in the krai are for developing deposits of mineral resources. At the same time, in the adjacent province of China, Heilongjiang, most of the new plants and the ones being modernized will operate in the sphere of processing natural resources, creating not only jobs but also higher value added.

What benefits will Russian regions get from the development of extractive industry? As a type of economic activity, the production of mineral resources, which provided only 9 percent each of GDP and total GRP of regions of the Siberian Federal Okrug in 2008, has become one of the main consumers of electricity (10 percent) and polluters of the environment. In 2008, it produced more than 20 percent of air pollutant emissions, and in 2007, more than 70 percent of the production and consumption wastes generated in the Russian Federation. In Zabaikalsky krai, this figure is more than 90 percent.

Thus, the development of exclusively extractive industry in the region not only does not make a significant contribution to the GRP of regions of the Siberian Federal Okrug but also leaves considerable environmental problems for the local population. No less pressing is the “problem of distribution of transgenerational effects,”<sup>17</sup> in relation to the revenues received from the sale of natural resources as well as the accumulation of pollutants, and also production and consumption wastes.

The authorities’ orientation to the development of only the raw materials sector of the economy does not promote long-term socioeconomic development, which is confirmed by the first results of the financial crisis, which had a considerable negative impact on the economy of the Russian Federation. For instance, in the first quarter of 2009, GDP fell by more than 8 percent in relation to the previous quarter, and, according to estimated data from the administration of Zabaikalsky krai, the drop in GRP in 2009 was 2.5 percent in relation to 2008.

\* \* \*

Based on a comparative analysis of regional data, we can distinguish the following characteristics of development of natural-resource regions of the Siberian Federal Okrug:

- a lag in the per capita economic growth rate, along with an excess level of negative environmental impact in comparison with the average Russian parameters;
- lack of a significant positive effect on the development of border regions of the Siberian Federal Okrug of important economic growth factors such as geographic location and an abundance of important types of natural resources; and

- the presence of considerable interregional differentiation with respect to basic parameters of economic growth and negative environmental impact, which is most pronounced in relation to the distribution of the environmental load (per capita) between regions of the Siberian Federal Okrug.

The existing contrasts between regions of the okrug with respect to the environmental and economic parameters considered may be intensified as a result of the implementation of investment projects involving the development of mineral resources in the territory of border regions. At present, the baseline scenario for the development of Siberia up to 2025 has not been fully reflected in short-term programmatic documents,<sup>18</sup> particularly those relating to interrelations with China. Thus, the existing approach to solving regional problems by reviving processes of cross-border cooperation harbors a danger of deterioration of the quality of the environment and bolstering the raw materials direction of the economy of regions of the Siberian Federal Okrug.

Taking into account the characteristics of development analyzed above, special attention should be given to the following directions when shaping the socioeconomic and environmental policy of border regions of the Russian Federation (and not just border regions!).

- Diversification of the regional economy and departure from a primarily raw materials direction of development of Siberian regions. Special attention should be given to supporting agricultural production because of the growth in domestic demand for environmentally clean agricultural products and the relative resistance of this sector to the impact of crisis phenomena in the economy.<sup>19</sup>
- Comprehensive assessment of the costs that occur as a result of negative environmental impact and the depletion of natural capital, and the benefits that society can get from the implementation of investment projects. In this case, along with traditional parameters characterizing the level of economic development, it is also advisable to use parameters of the quality of economic growth (ecointensity, ecoefficiency, etc.).<sup>20</sup>
- Improvement of the economic mechanism for natural resource use, realizing the “polluter pays” principle, as well as the development (taking into account international experience, among other things) of management tools that make it possible to use natural capital efficiently and to solve in a timely manner the most pressing problems that arise in the sphere of natural resource use and environmental protection.

## Notes

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