

THE IMPACT OF ECONOMIC ACTIVITY ON ECOLOGICAL PARAMETERS OF THE ECONOMIC SPACE OF THE SOUTHERN FEDERAL DISTRICT OF RUSSIA

The article explores the issues of heterogeneity of economic development of subjects (regions) of the southern Federal district, analyzes the impact of the economic activity on main indicators of pollution, which largely determine the quality of the natural environment. Authors show an assessment of air quality, recorded discharges of entities by contaminated wastewater, examines trends in waste production and consumption in the subjects of the Southern Federal district, most of which belong to the type of old industrial regions. The authors believe that the sustainable development of the mixed economy of Southern Russia needs measures of systemic nature, aimed at the rational use of resources in the process of managing and preserving the environment that requires correction of the district and regional strategies and programs for socio-economic development. That is now the priority of strategic territorial management, which involves the modernization of the economic complex of the Southern Federal district, taking into account the environmental imperative. It is becoming increasingly evident the necessity of a transformation of Federal districts into territorial centers for economic development, characterized by the economic space of a higher quality.

Keywords: region, Southern Federal district, economic complex, heterogeneity of economic development, diversity of the economy, structural and technological shifts, environmental externalities, technologically obsolete enterprises, pollution of territories, negative impact, environment.

Problem formulation. Under modern conditions a special acuteness acquires the problem of the strengthening of negative external effects of the economic activity when the majority of impacts are connected with the negative external effects of ecological character (pollution, refuse, destruction of natural objects. ecological damage and so on). Negative external effects will hardly influence the economic state of the enterprises polluters themselves. That's why costs and damage from their activity in direct sense are external ones [1; 2].

Meanwhile ecological negative external effects have a temporary effect that is directly connected with the conception of a sustainable development. Polluting the environment today, worsening the ecological parameter of life quality, mankind is catalyzing economic, social and ecological problems for future generations. A basic moment for the analysis is the extrapolation of additional external expenses by a contemporary generation for the future at the available technogenic development [3; 4].

Another trait of ecological negative externalities is a global character that leads to an aggravation of a number of problems connected for example with a transfer transboundary pollutants. Exhausts of chemical substances into the atmosphere, river pollution and other ecological impacts create con-

siderable ecological and economic problems as well as additional costs in other, especially transfrontal countries [5; 6].

For the economy of contemporary Russia different forms of property, types of economic activities, methods of manufacture coordination, types of economic relations regulation, degree of technical equipment availability in different industries, types of manufacturing organization are typical. The existing multisectoral character of the economy influences the behaviour of economic actors, creating a new type of economy based on the independence of decision taking by every subject in particular. One of the basic problems of the economic development in this period is becoming the technological monosectoral character denoting simultaneous functioning of both new productions and technologically obsolete enterprises [7; 8; 9].

The suggested division into federal districts for the purpose of the optimization of the administrative and territorial development is on the stage of the determination of the mostly efficient approaches concerning the questions of the regulation of the territorial development. In contrast to economic districts, federal districts are not territorial formations of either industrial or functional type. Basic managerial functions on the regional level keep being relied upon the governments of the subjects of the federation. However the neces-



sity of the transformation of federal districts into territorial centers of economic development used for the overcoming also an excessive asymmetric character and leveling problems of a polar interregional differentiation in a multisubjectoral and multisectoral economy of the country remains urgent [10; 11].

Analysis of recent research and publications. Conceptual aspects of the research of the impact of the economic activity on the environment are reflected in the works of such scientists as Ja.O. Andersson, M. Common, R. Costanza, R. Eriksson, C. Folke, B. Freedman, J. M. Greer, M. Hammer, A.M. Jansson, G. Kallis, R.B. Norgaard, U. E. Simonis, S. Stagl, B. Richard.

Problems of external consequences of the economic activity on the environment of urban territories are studied in the papers of a number of Russian scientists: N.E. Buletov, E. A. Kambarov, Z. G. Mirzekhanov, A. D. Murzin, N.A. Narbut, L. I. Sergienko, I. A. Zlochevsky and others.

The research of the problems and the assessment of prospects of the ecologically oriented stable development of the regions of the Southern federal district of Russia were made in the papers of the following Russian scientists: N.T. Avramchikova, G.A. Babkov, T.B. Bardakhanova, M.N. Chuvashova, T.S. Kuzmina, L.I. Muratova, A.S. Mikheeva, A.E. Safronova, L.A. Shirokova and others.

The methodological base of the research of scientific goals became the realization of the dialectical principles of research within a

systematic approach. Authors used general scientific and specific methods of research: subjective and objective method, structural and functional, historical and logical, comparative, imitational, statistical and other types of analysis.

Purpose of the artical. The authors on the basis of extensive statistical analysis of the material showed the external impact of business activities carried out in the regions of the southern Federal district of Russia on the environmental parameters of the economic space of the region.

Basic material research. Among nine federal districts of the Russian Federation it is in the Southern federal district where to the utmost the uneven character of the economic development of the economic actors and, as a result, differentiated character of the ecological problems appearing afterwards is displayed [12; 13].

In the regions of the Southern federal district the multisectoral structure of the economic activity can be characterized by the presence of several technological ways of functioning: half natural, petty economy (pre-industrial), industrial and, in parvo, innovative. This is connected with the fact that during the formation of the district that united territories of the South of Russia, both large industrial centers with ecological problems typical for them and agricultural krays and republics having principally other negative ecological effects resulting from the economic activity were included in it.

Table 1

Emissions of pollutant into the atmosphere by stationary and moving sources in federal districts of Russia (thousand tons)

Indices	By the date 01.01.2013	Share of the federal district in the total amount of emis- sions, %	Rank of the fed- eral district in the total list of the districts
Pollutants emitted into the atmosphere Totally in the Russian Federation Including	32468,1	100,0	
Central federal district	5099,7	15,7	4
North Western federal district	3470,4	10,7	5
Southern federal district	1877,2	5,8	6
North Caucasian federal district	847,6	2,6	8
Volga federal district	5205,6	16,0	3
Ural federal district	6623,9	20,4	2
Siberian federal district	7833,1	24,1	1
Far Eastern federal district	1511,0	4,7	7

Source: made on the basis of the data: Federal service of state statistics. Basic indices of the environmental protection in 2013



That's why concerning the pollution indices reflecting the quality of the environment, the Southern federal district during latest years does not display leading positions among the districts of the Russian Federation [14; 15; 16; 17]. As it is shown in table 1 the share of the Southern federal district in the total volume of the emissions of pollutants

into the atmosphere by stationary and moving sources amounted to only 5,8% that corresponds to 6th rank in the total list of Russian districts. At the same time the degree of participation of the southern regions in the formation of this index fluctuates considerably (table 1, 2).

Table 2

Emissions of pollutants into the atmosphere by stationary and moving sources in the regions of the Southern federal district by the beginning of 2013 (thousand tons)

Regions/Indices	Emissions into the atmosphere of pollutants, total	Share of the region of the Southern federal district in the total volume of emissions, %	Rank of the region in the total list of the subjects of the Southern federal district
Southern federal district	1877,2	100,0	
Republic of Adygea	32,8	1,7	6
Republic of Kalmykia	33,0	1,8	5
Krasnodar kray	673,1	35,8	1
Astrakhan region	247,7	13,2	4
Volgograd region	390,7	20,8	3
Rostov region	500,0	26,6	2

Source: made on the basis of the data: Federal service of state statistics. Basic indices on the environmental protection 2013

The main source of pollution of the atmospheric air in the regions of the Southern federal district in 2012 were vehicles. The share of the regions of the Southern federal district made up 1146,1 thousand tons of emissions of pollutants into the atmosphere from moving sources and about 731,1 thousand tons of emissions from stationary sources.

Judging from total emissions of pollutants from moving and stationary sources Krasnodar kray (35,5%) is the leader, then come Rostov region (26,6%), Volgograd region (20,8%), Astrakhan region (13,2%). Southern cities of Volgograd, Volgodonsk, Volzhsky are included into the list of the cities of Russia with the highest level of polluted air. Republics of Adygea and Kalmykia pollute the air in parvo and their share of total pollution make up only 1,7 and 1,8%. At the same time the share of the emissions from moving sources in the total volume of emissions in these republics makes up about 81% and 89% correspondingly. This fact is connected not only with a stable growth of vehicles observed in recent years that is accompanied by the increase of emissions of pollutants into the atmosphere and by the inconsistency

of vehicles with the standards' requirements, use of low quality gasoline [18; 19].

According to the data of the "Direction on the environment protection and natural resources and emergency situations of the Republic of Adygea" 2 986 sources of the pollutants were identified in the region in 80 objects. Emissions into the atmosphere in 2012 made up 117,5% in comparison with the previous year. The largest amount is due to the enterprises of communal services, construction industries, wood processing, pulp and paper industry, agriculture [20; 21]. Large sources of the atmospheric pollution are "Maykop thermal networks" (0,4 thousand tons), "Kartontara" (0,1 thousand tons) and "Kubangazprom" (0,2 thousand tons).

Pursuant to the information from "Direction of the Russian natural control in Republic of Kalmykia" the basic stationary sources of pollution are the enterprises of the fuel and energy complex and gas extraction. In the territory of republic powerful stationary sources of pollution are not found. However the revival of economic activity in the sphere of the maintenance of oil pipelines, construction of small oil refining enterprises, manufacturing of plastic production, development



of the construction and extracting industries increases risks of the atmospheric air pollution. Besides for a long period the republic is subject to a transboundary transfer of polluting substances from adjoining industrial territories [22].

However the mentioned above factors in the aggregate when there is no a licensed laboratory in monitoring and surveillance places for the atmospheric pollution in the Republic of Kalmykia do not allow assessing authentically the negative impact on the environment.

In Astrakhan region according to the data of the net of monitoring of the state service of environmental surveillance, the level of the atmospheric pollution in 2012–2013 is determined as a high one. The region of a high pollution of the atmosphere was controlled near high ways. The share of the emissions from moving sources of pollution in the total volume of emissions made up 45,7%. From stationary sources of energy the main one remains Ltd "Gazprom dobycha Astrakhan" whose share is about 82% from the volume of emissions with stationary sources.

Considerable pollution of atmospheric air is observed in three industrially developed regions of the Southern federal district (Krasnodar kray, Rostov and Volgograd regions) and made up in 2012 about 83% from the total volume of pollution. This fact shows the existing interregional changes in the economic specialization of the regions included into the district.

Multisectoral character of the regional economy of the Southern macroregion in many respects determines typical features of the impact of the anthropogenic activity on the environment in every region are determined. So, according to the information of the "Committee on the environmental protection and natural resource of Rostov region" in 2012-2013 a very high level of air pollution was recorded in Novocherkassk, a high level was observed in cities of Rostov on Don, Millerovo, Volgodonsk, Azov. In the territories of the mentioned above settlements the largest air polluters are concentrated [23].

In Azov and Volgodonsk the main "contribution" and emissions from stationary sources are made by the enterprises of house

and communal, energy, chemical, wood processing and oil processing complexes (PC "Donenergo", PC "Azovsky optikomekhanichsky zavod", Ltd "Bashneft-Yug", Municipal Unitary Enterprise "Volgodonsky khimzavod", Ltd "Spetsavtotrans", Volgodon Nuclear Power Plant and Thermoelectric station). For instance, in Millerovo the atmospheric air polluters include the enterprises of food industry (meat, vine, bread factory, butter making plant) of the agricultural machine construction, metal machinery. In the city of Novocherkassk there are enterprises of heat and power engineering, non-ferrous metallurgy, construction materials production, ready made garments, food production [24].

The largest number of the stationary sources of pollution are registered in the city of Rostov on Don, and mainly these are enterprises of fuel and energy, machine construction complexes, agricultural holdings and the enterprises of the construction industry (Ltd "Combine Harvester Plant "Rostselmash", affiliate of the North Caucasian Railroad "RZHD", PC "Rostselmashenergo" and others). That's why the main polluters are a number of firms situated in Taganrog, Tsimliansk, Shakhtinsk (PC "Tagmet", PC "Teploenergo", Private Company "Break factory", PC "Taganrog aviatsia", Private Company "Tsimliansky shipengineering plant", PC "Tsimlianskiye vina", Ltd "Shakhtinskaya Hydro and Thermal Power Plant", Ltd "Si-boil", "Electro and metallurgy plant").

In Volgograd region where of which more than 18 000 nature users are registered, the main "contribution" to the atmospheric pollution make enterprises of fuel, chemical, oil refining industry, car construction, metal processing, electrical energy, construction materials, ferrous and non ferrous metallurgy. During the period under consideration the share of emission from stationary sources made 43,7% from the total volume. The city of Volgograd and Volzhsky produce 62,49% from the volume. It is in these settlements the enterprises, contributing to the formation of the number of emissions are located. These 36 enterprises give 82% of the total number of substances emitted by stationary sources [25; 26].

In agricultural regions the emissions of pollutants enter the atmosphere without the purification in the process of the repairing works





and maintenance of the nets of main gas and oil pipelines situated in 13 from 32 districts of the region.

The main contribution to the atmospheric pollution of Krasnodar kray make the enterprises of fuel and energy complex and car transport. In some cities of the region vehicles account for up to 90% from the total volume of pollutants emitted into the atmosphere.

In 2012 the pollution of the atmospheric air in cities of Krasnodar and Novorossiysk is acknowledged to be high in connection with the functioning in their territories of oil refining enterprises, enterprises of electrical energy, oil and gas pipelines, fuel, food and construction materials productions. Besides in the city of

Novorossiysk the tendency to the increase of emissions from stationary sources at the expense of revival of the activity of a number of enterprises and freight turnover growth through the Novorossiysk trade port is noticed. In the city of Sochi tendency of growth of atmospheric air pollution near highways and in the streets of cities with intensive car traffic is kept.

Judging from the volume of sources the discharge into surface water objects in the regions of the Southern federal district has the highest percentage in the total volume of sources and it was observed in Krasnodar kray (64%), Rostov region (18,1%) and Volgograd region (10,4%) (table 4).

Table 3

Polluted sewage discharge into surface water objects in federal districts of Russia (mln. m³)

Indices	Condition by 01.01.2013	Share of the federal district in the total volume of discharge, %	Rank of the federal district in the total list of districts of the Russian Federation
Discharged polluted waste waters into surface water objects, total in Russian federation, including	15678	100,0	
Central federal district	3651	23,3	1
North Western federal district	2877	18,3	2
Southern federal district	1394	8,9	6
North Caucasian federal district	395	2,5	8
Volga federal district	2854	18,2	3
Ural federal district	1665	10,6	5
Siberian federal district	2077	13,2	4
Far Eastern federal district	765	4,9	7

Source: made on the basis of the data: Federal service of state statistics. Basic indices of the environmental protection in 2013

Table 4

Polluted sewage discharge into surface water objects in the Southern federal district (mln. m³)

Regions/Indices	Emissions into the atmosphere of pollutants, total	Share of the region of the Southern federal district in the total volume of discharges, %	Rank of the region in the total list of the subjects of the Southern federal district
Discharged polluted waste waters into surface water objects, total in the Southern federal district	1394	100,0	-
Republic of Adygea	28	2,0	5
Republic of Kalmykia	20	1,5	6
Krasnodar kray	892	64,0	1
Astrakhan region	56	4,0	4
Volgograd region	144	10,4	3
Rostov region	253	18,1	2

Source: made on the basis of the data: Federal service of state statistics. Basic indices on the environmental protection 2013

In other regions the share of the discharged waters in the total volume did not exceed 4%. During recent years according to the ratio under analysis, Southern Federal District

stably occupies the 6th place in the total list of the districts of the Russian Federation (table 3). However the necessity of modernization and reconstruction of treatment facilities and

waste discharges in all the regions of the Southern federal district requires considerable expenses. Most often this situation is determined by their improper state. The worn out items of the water purifying system is not capable of admission and efficient sewage treatment coming from the population, communal services and industrial enterprises [2].

In Republic of Adygea the wear and tear of sewerage system amounts to 80%. More than 340 kilometers of nets are to be replaced. Reconstruction is being conducted in treatment facilities of city of Maykop. The largest source of pollution of water resources is "Maikopvodokanal", whose discharge make up 97% of all volume of waste waters in the republic.

In republic of Kalmykia the main sources of water pollution are agricultural firms producing rice. The discharged waters are diverted into water objects located in drainless territories of the interfluvium of rivers Volga, Don and Terek. In general the anthropogenic impact on the water objects of Kalmykia from its own territory can be assessed as a minimal one. This is connected with the absence of polluting productions and small density of population. However waters are polluted from adjoining territories in rivers Kuma and Kalous (Stavropol kray) and using the main sewer (Astrakhan oblast).

In regional centers the most often the reason for pollution are normative work of city sewage systems, inefficient work of local sewage nets in a number of industrial enterprises of cities, absence of additional cleaning in municipal treatment facilities and devices controlling the consumed water under the conditions of the intensive development of plots attached to houses, emergency situation of city sewage nets, illegal connection of local sewage systems to storm water sewage system of large industrial, dwelling and communal objects.

In Astrakhan oblast the largest source of discharge of polluted sewage waters is the city water canal company "Vodokanal". According to the monitoring data, in 2012 the segments of the water objects with polluted waters industrial and household types of pollution with the intensity of pollution up to 100 maximum permissive concentrations. In

ground waters oil productions, nitrogen compounds and phenols are found. The substances of the 3rd class of danger predominate.

In Rostov region communal, industrial, mines, collector and drainage waste waters contain polluting substances. Types of economic activity, contaminating surface water objects in the territory of Rostov region are the following (as a percentage from the total volume of waste waters requiring purification) are production and distribution of electricity, gas and water – 60,0%; agriculture, hunting and forestry – 11,48%; coal industry 8,3%; processing industry – 5,3%. The main polluters are the river port in the city of Rostov-on-Don, North Caucasian railroad, purifying facilities of the sewage system, water intakes, disposal dumps for hard communal refuse of all large cities, Rostov Nuclear Plant, oil pipeline, industrial enterprises, small size vessels, agricultural surface discharges.

In Volgograd region as a result of the economic activity of industrial manufacturing enterprises the excess of the Maximum Concentration Limit concerning substances of phenol, cuprum ions, ammonium ions, oil products, zinc ions, ions manganese is regularly observed in the river Volga. In the river Don and the Tsimlyanskoye water reservoir the increase of the mentioned above index is recorded in phosphates, phenol, cuprum, aluminum, phosphamide [13; 16; 20].

In 2012 the total volume of polluting substances in waste waters discharged into surface water objects of the Nizhnevolzhsk basin district amounted to 36 819 thousand tons. The main enterprises discharging polluted waters without purification or insufficiently cleaned waste waters of Nizhnevolzhsk and Don basin regions are the following: Municipal enterprise "State water canal of Volgograd"; Ltd "Leninsky Water Canal"; Municipal enterprise of Kamyshin PUVKH; Volgograd PC "Khimprom"; Volgograd Hydroelectric dam; Volgograd Thermoelectric Station-2; Ltd "Lukoil Volgogradenergo"; kazak kholding company "PC Krasnodonskoye"; Municipal enterprise of communal service of Kamyshin region of Volgograd region; PC "Sebriakov Cement"; Municipal enterprise "Mikhailovskoye water supply and sewage system"; Municipal enterprise "Olkhovskoye communal services"; Ltd "Serafimovich communal system"; Federal





State Unitary Enterprise "Medveditsky experimental fish pond factory"; Municipal enterprise "Water supply and sewage system" of city of Uriupinsk; Ltd "Surovikinsky Water Canal"; State Medical Institution "Volgograd regional psychiatric hospital №1" of Kalachevsky region.

According to the data of the management of Kuban basin, discharge of waste waters into natural surface water ways in 2012 was made by 238 enterprises respondents having waste water discharges into natural water ways. 3 105,91 mln. cubic meters of polluted waters were discharged into the water objects of Krasnodar kray. Among them 1715,29 mln. cubic meters were not purified, 962 57 mln. cubic meters containing 53 658 of chemical substances required purification.

The main source of pollution of water resources of Krasnodar kray when analyzing industries are housing and communal services. About 90% of the organic and suspected particles as well as a number of other polluting substances are discharged in waste waters by housing and communal sources. The remaining volume of polluted waste waters is produced by agricultural enterprises (agricultural firm "Poltavskaya", "Kubanagro – Priazovye", "Krasnoarmeysky stud plant", kolkhoz - plant breeding "Rossiya").

Judging from the ratio of the industrial refuse creation and consumption in the total volume of the districts of Russia Southern

Federal District occupies the 7th rank (table 5). Besides the problem of refuse treatment in all the regions of the Southern federal district is considered to be the main one. During the analyzed period the highest level in the total volume of refuse was recorded in Krasnodar kray (56,60%), Rostov region (24,93%) and Volgograd region (16,72%). In other regions the share of the industrial and consumption in refuse the total volume in the district does not exceed 2% (table 6).

Reasons are diversified and depend on the economic specialization of regions. So, in agricultural republics the main polluters are municipal and village dumps, most of which are illegal ones, as well as forbidden and unsuitable for use protection substances for plants, industrial and consumption wastes [25; 26]. The main polluters are the galvanic sludge containing compounds of heavy metals, unworkable pesticides, worked out mercury lamps, batteries, sediments of treatment facilities, worn out tires, worked out fluorescent lamps, untenable pest killers, cattle breeding and poultry farming scrap, synthetic oils, paints, hard communal refuse [10;11; 27]. In large industrial centers only a part of the created refuse is returned into production, the rest (not decontaminated) are placed in dumps, sludge tanks, dung yards. Tons of hard communal and industrial refuse are created every year.

Table 5

Generation of industrial and consumption refuse in federal districts of Russia (thousand tons)

Indices	Condition by 01.01.2013 г.	Share of the federal district in the total volume of discharge, %	Rank of the federal district in the total list of districts of the Russian federation
Generation of industrial and consumption refuse – total in the Russian Federation including	5007937	100,0	-
Central federal district	170 397	3,4	5
North Western federal district	476 326	9,5	2
Southern federal district	16 261	0,3	7
North Caucasian federal district	3 306	0,1	8
Volga federal district	167 906	3,3	6
Ural federal district	256 456	5,1	4
Siberian federal district	3 469174	69,3	1
Far Eastern federal district	448 113	8,9	3

Source: made on the basis of the data: Federal service of state statistics. Basic indices of the environmental protection in 2013

Table 6

Generation of industrial and consumption refuse in the regions of the Southern federal district (thousand tons)

Regions/Indices	Emissions of pollutants into the atmosphere, total	Share of the region of the Southern federal district in the total volume of emissions, %	Rank of the region in the total list of the subjects of the Southern federal district
Generation of industrial and consumption refuse in total in Southern federal district including	16 261	100,0	-
Republic of Adygea	5	0,03	5
Republic of Kalmykia	4	0,02	6
Krasnodar kray	9 198	56,60	1
Astrakhan region	280	1,70	4
Volgograd region	2 720	16,72	3
Rostov region	4 054	24,93	2

Source: made on the basis of the data: Federal service of state statistics. Basic indices on the environmental protection 2013.

According to the inventory of the objects of the industrial and consumption refuse placement in Krsnodar kray there exist 320 dumps of hard communal refuse; 499 dung pits and 29 litter dumps, 13 spots of placement of industrial refuse.

In Rostov region 16 dumps of hard communal refuse; 6 industrial refuse and 697 dumps are located.

In the structure of the regional list of the spots of the refuse placement of Volgograd regions there are 712 objects. They are: 14 reservoirs of liquid and paste like inorganic refuse of processing industries, 1 reservoir of liquid and pastelike organic refuse, 8 dumps for industrial refuse, 685 dumps for temporary accumulation of wastes and 4 dumps for hard communal wastes.

List of the created refuse in mentioned places is presented by substances of all classes of danger and leads to aggravation of the condition of environment in the territory of all regions [27].

Conclusion and prospects for further research. Technologically obsolete enterprises not only bring down the efficiency of national economy but also cause unrecoverable ecological damage to the environment. Spontaneous structural and psychological shifts in the Russian economy influenced by a strong wish to achieve competitive advantages by its agents are accompanied by intersectoral imbalances and make considerable difficulties

for a practical realization of programs of social, ecological and economic transformation of the economic space of Russian regions.

Under the given circumstances the provision of the stable development of the multi-structural economy of the South of Russia the systematic measures in the rational use of resources and protection of environment is the basic strategic task implying the modernization of the economic complex of the Southern federal district taking into account ecological imperative. At the same time the simultaneous existence in the regions of the district of different types of economic practice should not prevent from attracting the resource for modernization into southern regions irrespective of the economic type in equal conditions. Not only the attraction of strategic investments within the frames of the state and corporative target programs, megaprojects of territorial development [28], but also private investments into segments of economic complex of the Southern federal district are to be accompanied by active measures in the reproduction and the protection of regional resources.

The prompt realization of the complex of measures will help to reduce external ecological expenses of the economic activity in southern regions of Russia including the following: construction of the plants in compacting, deactivation, reprocessing and waste packing; elimination of illegal dumps and creation of places of the systematized refuse





collection; intensification of work of communal services concerning cleaning municipalities and adjoining territories from hard communal refuse; introduction of innovative technologies of utilization and reprocessing of industrial refuse in enterprises.

References

1. Freedman, B. (1995). *Environmental Ecology*. 2nd ed. San Diego: "Academic Press", 115–156 (in Engl.).
2. Jansson, A.M., Hammer, M., Folke, C., Costanza, R. eds. (1994) *Investing in Natural Capital: The Ecological Economics Approach to Sustainability*. Washington, DC: "Island Press", 504 (in Engl.).
3. Andersson, J. Otto, Eriksson, Ralf (2010). *Elements of Ecological Economics*. New York: "Routledge", 164 (in Engl.).
4. Common, Michael, Sigrid, Stagl (2005). *Ecological Economics: An Introduction*. Cambridge, UK: "Cambridge University Press", 592 (in Engl.).
5. Greer, John Michael (2011). *The Wealth of Nature: Economics as if Survival Mattered*. Gabriola Island, BC: "New Society Publishers", 288 (in Engl.).
6. Kallis, Giorgos, Norgaard, Richard B. (2010). Coevolutionary ecological economics. *Journal Ecological Economics – ECOL ECON*, 69–4, 690–699 (in Engl.).
7. Avramchikova, N.T., Chuvashov, M.N. (2014). The problem of improving the quality of economic space in resource-oriented regions of the Russian Federation ["Problemy povysheniya kachestva jekonomicheskogo prostranstva v resurso-orientirovannyh regionah Rossijskoj Federacii"]. *Regional economy: theory and practice*, 5, 2–11 (in Russ.).
8. Narbut, N.A., Mirzekhanova, Z.G. (2013). The necessity of taking into account regional specificities in environmental programs city development (on the example of Khabarovsk) ["Neobhodimost' ucheta regional'nyh osobennostej v jekologicheskikh programmah razvitija goroda (na primere Habarovska)"]. *Ecology of urbanized territories*, 1, 34–38 (in Russ.).
9. Safronov, A.E., Pavlenko, T.S. (2012). Rational use of natural and economic potential of the region. *Regional Economy* ["Racional'noe ispol'zovanie prirodno-jekonomicheskogo potenciala regiona"]. *South of Russia*, 13, 463–469 (in Russ.).
10. Babkov, G.A., Muratova, L.I., Safronov, A.E. (2013). Ocenka i ispol'zovanie prirodno-jekonomicheskogo potenciala regional'noj jekonomiki [Evaluation and use of natural and economic potential of the regional economy]. *Regional Economy. South of Russia*, 2, 30–36 (in Russ.).
11. Murzin, A.D. (2012). Comprehensive assessment of the socio-ecological-economic factors of the state of urbanized territories ["Kompleksnaja ocenka socio-jekologo-jekonomicheskikh faktorov sostojaniya urbanizirovannyh territorij"]. *Regional economy: theory and practice*, 8, 44–50 (in Russ.).
12. Kuzmina, T.S. (2012). Environmental audit as a tool for improving the economic mechanism of environmental protection ["Jekologicheskij audit kak instrument sovershenstvovaniya jekonomicheskogo mehanizma zashhity okruzhajushhej sredy"]. *Regional Economy. South of Russia*, 13, 477–483 (in Russ.).
13. Starokozheva, G.I. (2013). Specially protected natural territory of the southern Federal district: the improvement of the mechanism of governance ["Osobo ohranjaemye prirodnye territorii Juzhnogo federal'nogo okruga: sovershenstvovanie mehanizma upravlenija"]. *Regional Economy. South of Russia*, 2, 163–169 (in Russ.).
14. Baranov, I.V. (2013). About the indicators substitution damage and sustainability of industrial development in Russia ["Ob indikatorah «zameshhenija ushherba» i ustojchivosti razvitija promyshlennosti Rossii"]. *National interests: priorities and security*, 2, 28–34 (in Russ.).
15. Kambarova, E.A. (2011). Socio-economic and ecological problems of the development of large recreation centers of Krasnodar Krai ["Social'no-jekonomicheskie i jekologicheskie problemy razvitija krupnyh rekreacionnyh centrov Krasnodarskogo kraja"]. *Regional Economy. South of Russia*, 12, 321–334 (in Russ.).
16. Medyanik, N.V. (2013). Spatial-sectoral priorities for environmental transfor-

mation prirododruzhestvennoy system of the southern regions of Russia [“Prostranstvenno-otraslevye priority jekologicheskoy transformacii prirodohozjajstvennoj sistemy regionov Juga Rossii”]. *Fundamental research*, 11-5, 1001–1006 (in Russ.).

17. Medyanik, N.V. (2013). Contradictions of development portokosten systems of the southern regions of Russia [“Protivorechija razvitiya prorodohozjajstvennyh sistem regionov Juga Rossii”]. *Proceedings of the Sward*, 3(39), 79–82.

18. Krupina, N.N. (2013). Assessment of the environmental acceptability of technological innovation [“Ocenka priemlemosti prirodohrannyh tehnologicheskikh innovacij”]. *National interests: priorities and security*, 3, 35–44 (in Russ.).

19. Mitrofanova, I.V., Starokozheva, G.I. (2013). Economic complex of the southern Federal district in the WTO: options to reduce industry risks [“Khozyaystvenny kompleks YuFO v usloviakh VTO: puti snizhenia otraslevykh riskov”]. *Regional Economy. South of Russia*, 1, 75–82 (in Russ.).

20. Lipina, S.A. (2013). Social medicine and the green economy: foresight technologies [“Social'naja medicina i zelenaja jekonomika: forsajt jekotehnologij”]. *Regional Economy. South of Russia*, 2, 84–89 (in Russ.).

21. Bugaian, S.A. (2012). Minimization of waste production of industrial enterprises as a factor in solving the problem of energy saving [“Minimizacija obrazovaniya othodov proizvodstva promyshlennymi predpriyatijami kak faktor resheniya problemy jenergosberezheniya”]. *Regional Economy. South of Russia*, 13, 499–505 (in Russ.).

22. Safronov, A.E., Zholobova, Yu.S. (2013). Methodological approaches to the formation of regional policy green of industrial activity [“Metodologicheskie podhody k formirovaniyu regional'noj politiki jekologizacii proizvodstvennoj dejatel'nosti”]. *Regional Economy. South of Russia*, 2, 22–29 (in Russ.).

23. Zlochevsky, I.A., Bulatova, N.E. (2014). Industrial policy as a tool for management of ecological-economic system of the city [“Promyshlennaja politika kak instrument upravleniya jekologo-jekonomicheskoy sistemoy goroda”]. *Regional economy: theory and practice*, 19, 22–28 (in Russ.).

24. Sergienko, L.I. (2014). Ecology and health of the population of the urban area on the example of Volzhsky, Volgograd region [“Jekologija i zdorov'e naselenija urbanizirovannoy territorii na primere g. Volzhskogo Volgogradskoj oblasti”]. *Ecology of urbanized territories*, 1, 21–24 (in Russ.).

25. Mikheyeva, A.S., Bardahanova, T.B., Aseeva, S.N. (2013). Regional peculiarities of the formation of eco-oriented investment policy in areas with environmental restrictions [“Regional'nye osobennosti formirovaniya jekologoorientirovannoy investicionnoj politiki na territorijah s jekologicheskimi ograničenijami”]. *Regional economy: theory and practice*, 27, 2–7 (in Russ.).

26. Shirokov, L.A., Shirokova, O.L. (2013). Modeling the environment of industrial areas to optimize environmental investments [“Modelirovanie okruzhajushhej sredy promyshlennykh zon dlja optimizacii prirodohrannykh investicij”]. *Ecology of urbanized territories*, 2, 16–22 (in Russ.).

27. Asymmetric Character of Social and Natural System of Southern Macrorregion of Russia: Peculiarities of Revelation, Measurement, Mechanism of Management [“Assimetrichnost' razvitiya sotsioprirodokhoziaystvennoj sistemy Uzhnogo makroregiona Rossii: osobennosti proyavleniya, izmereniye, mekhanizmy upravleniya”]. Edit. by Doctor of Economics I.V. Mitrofanova, Doctor of Economics N.P. Ivanov. Stavropol: RIO IDNK, 2012. 239 p. (in Russ.).

28. Mitrofanova, I.V., Mitrofanova, I.A. (2013). Megaprojects as constructors of the mesoeconomic spaces of the contemporary Russia: potential, risks, trends and prospects. *Journal of International Scientific Publications: Economy & Business*, 7(2), 167–177.





Митрофанова І. В., Старокожева Г. І., Батманова В. В.

**Вплив господарської діяльності на екологічні параметри економічного простору
Південного федерального округу Росії**

У статті досліджуються питання неоднорідності економічного розвитку суб'єктів Південного федерального округу, аналізується вплив господарської діяльності на основні показники забруднення, багато в чому визначають якість навколишнього природного середовища. дається оцінка якості атмосферного повітря, реєстрованих скидів господарюючими суб'єктами забруднених стічних вод, досліджується тенденції в освіті відходів виробництва та споживання в суб'єктах ЮФО, більшість з яких відносяться до типу старопромислових регіонів. Автори впевнені, що забезпечення сталого розвитку багатоукладної економіки Півдня Росії потребує заходи системного характеру, спрямованих на раціональне використання ресурсів у процесі господарювання та збереження навколишнього середовища, що вимагає корекції окружної та регіональних стратегій і програм соціально-економічного розвитку. Саме такою є сьогодні пріоритетне завдання стратегічного територіального менеджменту, що передбачає модернізацію господарського комплексу ЮФО з урахуванням екологічного імперативу. Стає все більш очевидною необхідність трансформації федеральних округів в територіальні центри економічного розвитку, що відрізняються більш високим екологічним якістю економічного простору.

Ключові слова: регіон, Південний федеральний округ, господарський комплекс, неоднорідність економічного розвитку, багатоукладність господарства, структурно-технологічні зрушення, екологічні екстерналії, технологічно застарілі підприємства, забруднення територій, негативний вплив, природне середовище.

Митрофанова И. В., Старокожева Г. И., Батманова В. В.

Влияние хозяйственной деятельности на экологические параметры экономического пространства Южного федерального округа России

В статье исследуются вопросы неоднородности экономического развития субъектов Южного федерального округа, анализируется влияние хозяйственной деятельности на основные показатели загрязнения, во многом определяющие качество окружающей природной среды. дается оценка качества атмосферного воздуха, регистрируемых сбросов хозяйствующими субъектами загрязненных сточных вод, исследуется тенденции в образовании отходов производства и потребления в субъектах ЮФО, большинство из которых относятся к типу старопромышленных регионов. Авторы уверены, что обеспечение устойчивого развития многоукладной экономики Юга России нуждается в мерах системного характера, направленных на рациональное использование ресурсов в процессе хозяйствования и сохранение окружающей среды, что требует коррекции окружной и региональных стратегий и программ социально-экономического развития. Именно такой является сегодня приоритетная задача стратегического территориального менеджмента, что предполагает модернизацию хозяйственного комплекса ЮФО с учетом экологического императива. Становится все более очевидной необходимость трансформации федеральных округов в территориальные центры экономического развития, отличающиеся более высоким экологическим качеством экономического пространства.

Ключевые слова: регион, Южный федеральный округ, хозяйственный комплекс, неоднородность экономического развития, многоукладность хозяйства, структурно-технологические сдвиги, экологические экстерналии, технологически устаревшие предприятия, загрязнение территорий, негативное воздействие, природная среда.

Рецензент: Морозова И. А. – доктор экономических наук, профессор кафедры «Экономическая теория и мировая экономика» Волгоградского государственного технического университета, Волгоград, Российская Федерация.

Reviewer: Morozova I. – Professor, Ph.D. of Economics, Professor of Chair of International Economy and Economic Theory Department, Volgograd State Technical University, Volgograd, Russian Federation.

e-mail: morozovaira@list.ru

*Статья подана
05.04.2015 г.*