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Problems of Quality Assurance in Managing the Environment in Russian Cities

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Transport and industrial enterprises are the reasons for the basic pollution of the environments of large cities. This problem is particularly acute in Russia, where strict environmental standards either do not exist or are not enforced.

Ecological-economic mechanism of environmental management in cities is an important component of the urban management system and is used both as an instrument to regulate the system of urban planning and ecological situation in the cities and as an additional source to get the funds into the municipal budget due to environmental charges, land tax and rental charges. However, these management and resource providing features of ecological-economic mechanism of environmental management in large cities is used in the practice insufficiently because of underestimation of ecological factor in the system of economic relations, lack of socio-ecological and economic consensus of all the city subjects in keeping and improving the city environment.

Improving the management of ecological and economic system of urban environmental resources usage is largely dependent on functional type of the city and the number of people inhabiting it. In this context, the author distinguishes the following urban areas:

1. Capital (Moscow);
2. Major regional centers of Russia, including St. Petersburg;
3. Multifunctional cities;
4. Medium-sized cities with one or two city-forming enterprises;
5. County towns and other settlements.

The ecological and economic mechanism of environmental resources management aimed at contributing to the city budget has been formed in Moscow. The matter of

differentiating property right for land between federal and municipal authorities has not been solved yet. The main problem in ecological and economic mechanism of urban land-use management in Moscow is inconsistency of the environmental and economic components, focus on financial results that leads to environmental problems during the construction and exploitation of land facilities and traffic flow increasing .

The incentive ecological and economic mechanism of environmental resources usage is generally formed in Major regional centers of Russia. In regional centers moving the enterprises polluting the environment to the suburbs is slowed down because of lack of equipped land for investors. Removal of ecologically destructive and harmful industries is still important for cities.

Problems in the functioning of ecological and economic mechanism are connected with the inefficient use of land. In some cities the shadow land markets have been formed, they are characterized by the lack of environmental expertise, transferring land to non-core companies for further reselling, starting construction before signing rental contract, etc.

To solve this problem the environmental and economic mechanism of environmental management in major regional centers of Russia must be reinforced by institutional norms, based on the general plans of urban development, environmental forecasting and various evaluations of the territory, transparency of land transactions. Municipal authorities should support the land market forming and regulated functioning in the city.

Multifunctional cities have either limiting or incentive ecological and economic mechanism of environmental management.

Limiting ecological and economic mechanism of environmental management is formed in medium-sized cities with one or two city-forming enterprises. First of all, this process concerns the cities with population of 200 thousand inhabitants who entirely depend on the performance of city-forming enterprises located there. If the company faces financial difficulties or goes bankrupt, it leads to the municipal budget cuts and the population gets poor. The land market isn't developed in such cities, that's why the formed structure of land exploitation doesn't have any impulses for its development.

County towns and other settlements are mostly characterized by ecological and economic mechanism of environmental management, aimed at "surviving" of territories. The insufficiently financed ecological and economic mechanism is formed in the cities, that's why the authorities sometimes can not provide the elementary conditions for the territory functioning. Problems are connected with the backwardness of land market and the inconsistency of the local self-government power to their resource maintenance. To solve

these problems is necessary to develop regulations of financial balancing at the municipal level which will be legally fixed, and, on the one hand, provide the necessary level of the municipalities existence, on the other hand, stimulate the municipal authorities initiatives in the search and development of extra sources of funding.

As for land use, the key component of ecological-economic mechanism is land-user connection to specific land plots which is expressed in the ownership or usage of the land plots. As for ecological situation, compensation for damage caused by the land-users is considered to be the most important in the mechanism. The damage can be compensated both at the upon the application of other land-users and on the initiative of the local authorities. The ideal situation is when the damage is compensated fully to population, industries and the environment. The need to compensate for the damage led to the development of relevant methods, regulatory and legislative acts, and judicial practice.

The complex structural and logical scheme of ecological-economic mechanism of urban land use with combined administrative and market management methods is shown in Figure 1.

The economic crisis has contributed dually to ecological situation. On the one hand, the resources aimed at the environmental protection were reduced; on the other hand, industrial enterprises have produced less products and less pollution. If any efforts aren't undertaken to improve the mechanism of environmental management at the present time, it will negatively affect the environmental situation during the next industrial growth.

The author proposes a model for designing an economic mechanism of environmental management in large cities depending on management methods used at the present time, their ecological and economic efficiency and possibility of including new management tools into the mechanism.

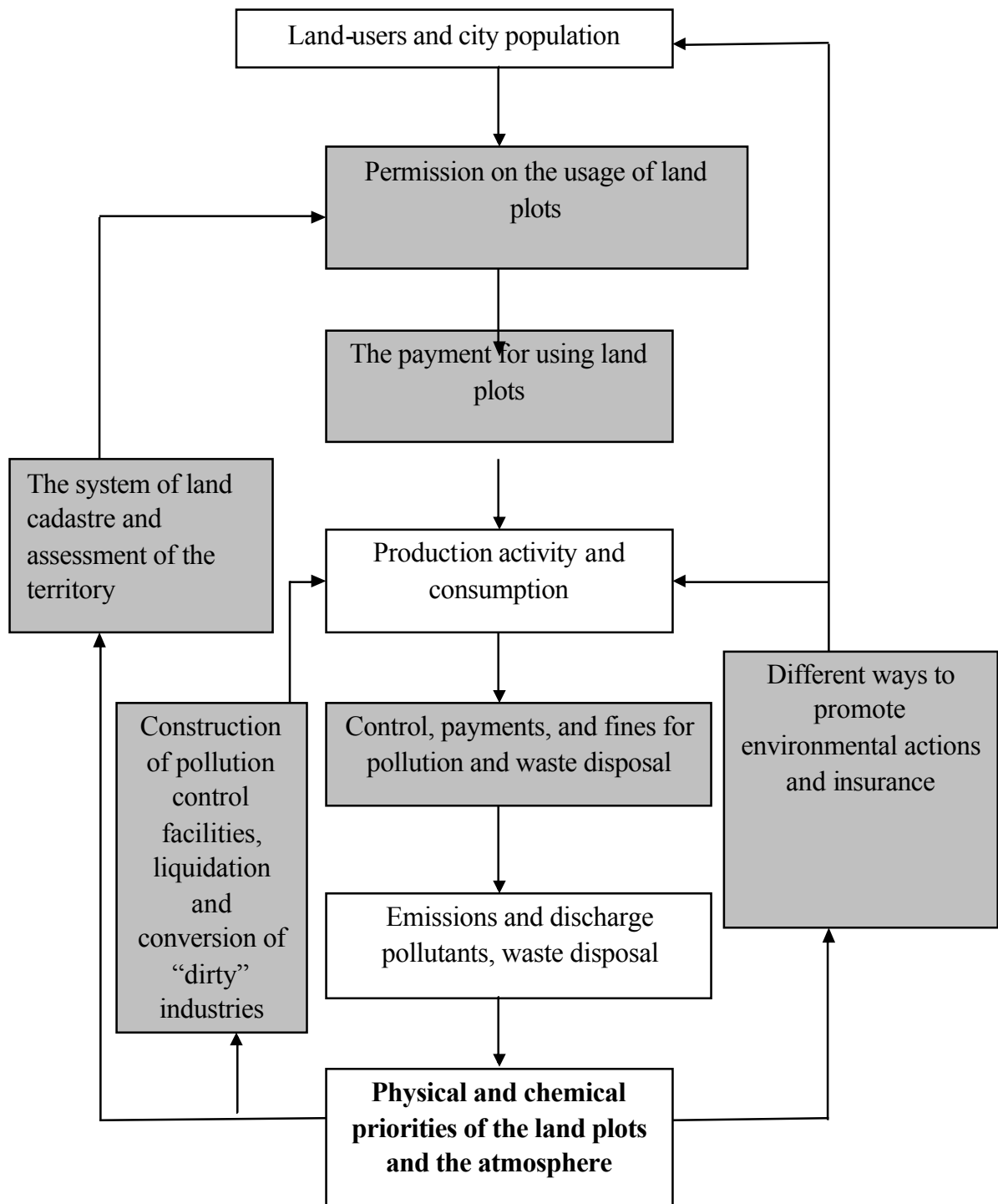


Fig.1 - The complex structural and logical scheme of ecological-economic mechanism of urban land use

During the modeling of ecological-economic mechanism of urban land use it is necessary to choose a rational variant of regulative instruments which will lead the system of urban land use to the expected form. According to the author, there are three aims that could be achieved in the cities: reducing pollution, improving the stability of the system, increasing the profitability of the land due to optimization of its usage. The aims are interrelated but the local authorities must define in what direction the land affairs will develop.

The current system of urban land use in large cities has got certain regulative tools. For construction of a new system it is necessary to estimate: the cost of involving a certain instrument into the system, the cost of instrument operating, the income got due to operation of instrument, the impact of the instrument on the final aim. In order to reveal all possible options for constructing a system the method of enumeration is used. Construction of the management mechanism is done for the city of Volzhsky (Russia), the amount of costs are agreed with the specialists of service for environmental protection and ecological security.

Every year for the program realization the city is to allocate 500 000 euros.

The purpose of the task was to maximize efficiency of regulative tools in environmental-economic mechanism of urban environmental management (Schedule 1).

For getting necessary information there were considered two alternative tasks which were formulated independently of each other. At first, it was necessary to obtain the maximum index of influence on reducing pollution:

$$25 Kz = \Pi kz_N \rightarrow \max, N = 1$$

Where N is a number of the tool; kz_N is an index of influence on reducing pollution of N tool.

Secondly, it was necessary to obtain the maximum index of increasing sustainability of urban systems:

$$25 Ku = \Pi ku_N \rightarrow \max, N = 1$$

Where ku_N is an index of influence on improving sustainability of urban systems of N tool.

The funds were considered as a limiting factor.

Stages of the ecological-economic mechanism of urban environmental land use

| On the basis of reducing pollution | On the basis of increasing sustainability |
|--|--|
| <i>The first year</i> | |
| Setting of the limits on emissions and discharges. Setting of the costs for the right to lease the land. Setting of the limits on emissions and discharges. Setting of the fine system for oversized pollution. Closing “dirty” industries. Involving ecological inspection. The system of environmental management. | Setting of the limits on emissions and discharges. Setting of the costs for the right to lease the land. Accounting and economic evaluation of the land plots. Implementation the best technology. The system of environmental insurance. |
| <i>The second year</i> | |
| Creation of environmental forecasts. Involving ecological audit. Purchase of land plots. Construction of pollution control facilities. Implementation the best technology. Recycling. The system of environmental insurance Licensing of environmental activities. Creation of ecological funds. Setting of tax benefits. Trade pollution rights. Using system of “land-repayment”. Implementation of the system of ecological education. Improvement of areas including landscape gardening. System of material compensation. | Creation of environmental forecasts. Involving ecological audit. Setting of the limits on emissions and discharges. Setting of the fine system for oversized pollution. Closing “dirty” industries. Involving ecological inspection. |
| <i>The third year</i> | |
| Charging for land usage. Differentiation of land payment. Accounting and economic evaluation of the land plots. | Charging for land usage. Differentiation of land payment. Purchase of land plots. Construction of pollution control facilities. Recycling. The system of environmental management. Licensing of environmental activities. Creation of ecological funds. Setting of tax benefits. Trade pollution rights. Using system “land-repayment”. Involving the system of ecological education. Improvement areas including landscape gardening. System of material compensation. |

As almost all the tools require own financial resources for an effective operation, additional annual costs of maintaining the system amounted to 116 000 euros after including 25 tools into ecological-economic mechanism. The author considers that the costs should be taken from the municipal budget.

The combination of specific tools in ecological-economic mechanism of urban land use determines the features of urban environment and quality of life. The usage of market and administrative management tools of the urban land use mechanism changes the economical system, the environment, the transportation system, urban landscape and the structure of urban area zoning.