

ENVIRONMENTAL ECONOMICS

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The implementation of the economic control mechanism of environmental protection (in the case of water bodies in St. Petersburg)

Economic approaches to rational nature management and environmental protection are becoming increasingly important in environmental management. There are inevitable contradictions between economic activity and natural systems that reveal in varying degree and that have different ways of solution. The formation of an effective economic mechanism of nature management and environmental protection is a preferred direction in this case. The article investigates the payment for natural resources, fines for violations, as well as the cost of the natural environment restoration as the most significant factors in environmental protection.

The economic mechanism of nature management, environmental protection, rational nature management, natural resource limits, standards of payments and the amount of payments, environmental funds, environmental stimulation.



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Environmental issues are one of the most pressing global problems in the modern world in recent years. They are strained especially in large cities due to the whole complex of factors that include the development of the city, its industry, construction, transport and socio-economic sphere.

Economic approaches to rational nature management and environmental protection are becoming increasingly important in the state environmental management in cities along with the use of administrative methods. The formation of an effective economic mechanism of nature management and environmental protection is a preferred direction in this case.

The concept of the “economic mechanism” of environmental protection is a set of legal norms, governing the conditions and procedures of money accumulation, received as the payment for environmental pollution and other harmful impacts on it, financing of conservation measures and economic incentives for business entities by force of tax and other remissions.

The law “On Environmental Protection” [1] defines the basic elements of the concept of the economic mechanism of environmental protection. They include:

- economic aspects of natural resource accounting;
- planning and funding of environmental arrangements;

- natural resource limits, pollutant emission and waste disposal limits;
- standards of payments and the amount of payments for natural resources, pollutant emissions, waste disposal and other harmful effects;
- the creation and consumption of environmental funds;
- environmental insurance;
- promotion of activities that provide a conservancy effect, promotional prices and allowances for ecologically pure products.

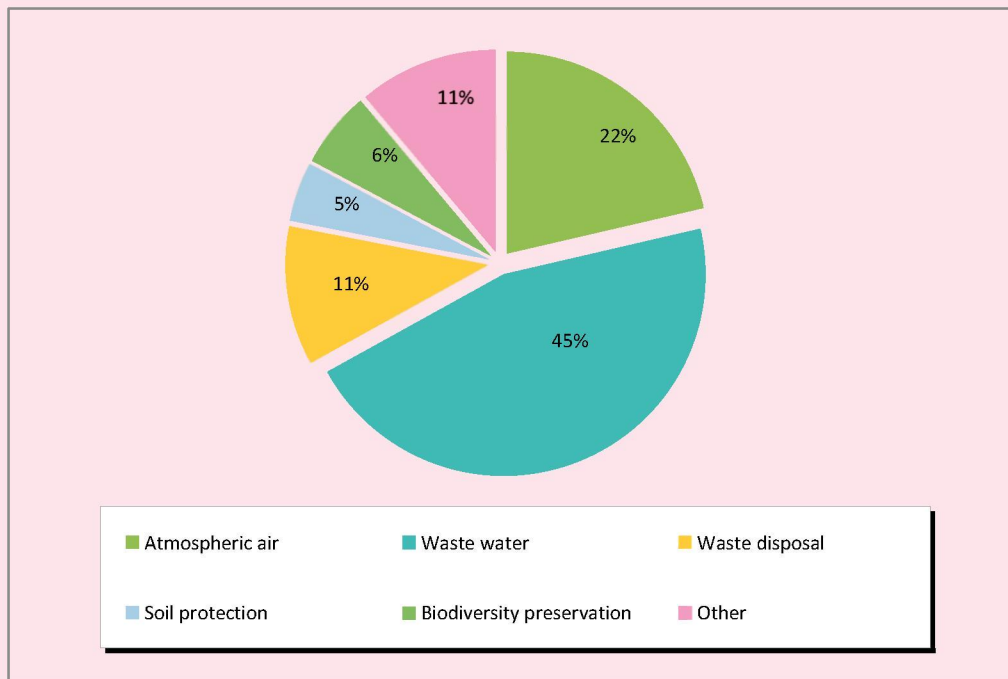
This article deal with some of these issues relating to the payment for natural resources, fines for violations and natural environment restoration costs as the most significant factors in environmental protection in Saint Petersburg. Having regard to the fact that environmental standards and regulations are the measures to harmonize environmental and economic interests, it’s possible to note that the economic mechanism of urban environmental protection is aimed at the creation of the conditions for the considerate attitude to nature both of people and businesses.

The issues of water consumption, water pollution and waste water treatment are acute environmental problems of large cities. Data on the ratio of waste water treatment costs in the total environmental costs in the RF show that waste water treatment costs are increased each year, and they account for more than 40% (tab. 1, fig. 1) [2].

Table 1. Environmental costs in the Russian Federation, bln. rub.

| The directions of protection activity | 2008 | 2009 | 2010 | 2010 to 2010, ± |
|---|--------|--------|--------|-----------------|
| Total | 368627 | 343368 | 372382 | 3755 |
| Including: | | | | |
| air protection | 76773 | 60101 | 80071 | 3298 |
| waste water treatment | 159299 | 162175 | 169152 | 9853 |
| waste disposal | 40326 | 38806 | 41510 | 5184 |
| protection and rehabilitation of soil, ground and surface water | 27321 | 18696 | 17219 | -10102 |
| Biodiversity and habitat preservation | 26597 | 21463 | 22975 | -3622 |
| Other | 38311 | 42127 | 41455 | 3144 |
| Source: Data of Russian Federal State Statistics Service. | | | | |

Figure 1. The structure of environmental costs in the Russian Federation, 2010



Modernization allowance or increase in the basic assets in the sphere of environmental protection and rational nature management, as well as water protection costs amount to more than 40% in the structure of total costs. The sum of 46 million rubles or 52% of the total amount of 89 million rubles was used for water protection in 2010 (*tab. 2, fig. 2*).

The analysis of the implementation of water protection facilities in the Russian Federation proves that the plants for waste water treatment turned up their power from 234 thousand m³ to 462 thousand m³ per day in 2010 as compared with 2008, and water recycling systems – from 992 thousand m³ to 1050 thousand m³ per day.

As a result of untreated water discharge by industrial enterprises and municipal sewerage, a lot of water bodies in the country are so polluted that the use of them for water supply is difficult or even practically impossible. Waste water dumping is the main cause of the continued pollution of natural basins; this fact is evidenced by statistical data on the North-West Federal District and, in particular, on the city of St. Petersburg (*tab. 3*).

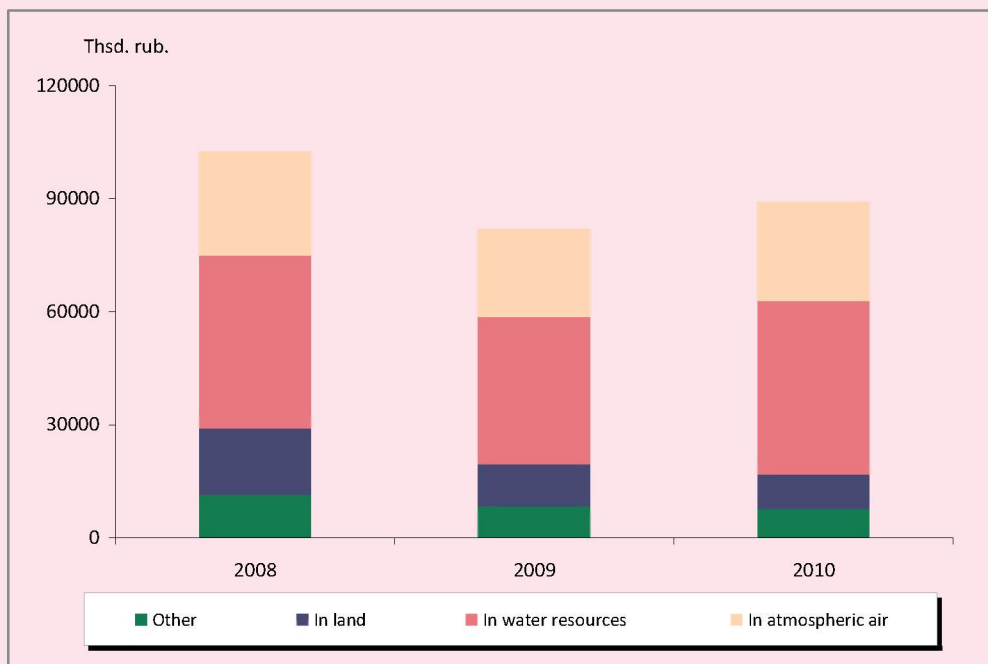
The table shows that there is an annual increase in the volume of waste water discharge in the North-West Federal District (it was more by 6.7% in 2010 than in 2008); the increase in the volume of waste water discharge in St. Petersburg has been almost stopped in recent years. At the same time the share of St. Petersburg in the total waste water discharge is decreased rapidly (11.2% in 2008, 11.1% in 2009, 10.56% in 2010).

The main volume of waste water dumping in St. Petersburg includes the waste water discharged into surface water bodies (about 90%). Therefore, the share of other types of waste water dumping is less than 10%, including the waste water discharged directly to soil. The volume of the waste water discharged into surface water bodies includes the volume of normative-clear wastewater, effluent water and polluted water (industrial and communal) discharged into surface water bodies. However, it is possible to discharge industrial, residential, drain waste waters, as well as their other types only with the permission of water protection organizations

Table 2. Fixed capital investment in environmental protection and rational nature management in the Russian Federation, bln. rub.

| Investment pattern | 2008 | 2009 | 2010 | 2010 to 2010, ± |
|--|--------|-------|-------|-----------------|
| Total | 102388 | 81914 | 89094 | -13294 |
| Including fixed capital investment in the protection of: | | | | |
| atmospheric air | 27542 | 23242 | 26127 | -1415 |
| water resources | 45696 | 39219 | 46025 | 329 |
| land | 17749 | 11045 | 9340 | -8409 |

Figure 2. The structure of fixed capital investment in environmental protection in the Russian Federation


 Table 3. The volume of waste water dumping in St. Petersburg, thousand m³

| Indicator | 2008 | 2009 | 2010 | 2008 to 2006, ± |
|--|-------|-------|-------|-----------------|
| Waste water discharge in the regions of the North-West Federal District, total | 11648 | 11865 | 12427 | 779 |
| in St. Petersburg | 1304 | 1317 | 1312 | 8 |
| including waste water discharge into surface water bodies | 1173 | 1187 | 1174 | 1 |
| The same indicator, in % | 90.0 | 90.1 | 89.5 | -0.5 |

and according to the agreement of the state sanitary supervision. The quality of discharged water must meet the required standards. If these requirements are violated, the discharge of waste water should be restricted, suspended or denied by control authorities.

The current costs of water protection and rational water utilization, as well as the overhaul costs of basic assets, constructions, effluent treatment plants and rational water utilization in St. Petersburg increase permanently (*tab. 4*).

Table 4. The costs of water protection and rational water utilization in the North-West Federal District and in St. Petersburg, mln. rub.

| Types of costs | 2008 | 2009 | 2010 | 2010 to 2008, ± |
|---|---------|---------|---------|-----------------|
| <i>Current costs</i> | | | | |
| North-West Federal District, total | 11877.2 | 19589.9 | 20493.2 | 8616.0 |
| St. Petersburg | 1979.0 | 7802.9 | 7752.2 | 5773.2 |
| <i>The overhaul costs of basic assets</i> | | | | |
| North-West Federal District, total | 1000.7 | 886.9 | 1028.8 | 28.1 |
| St. Petersburg | 154.3 | 303.9 | 432.2 | 277.9 |

The costs of water protection and rational water utilization have increased dramatically over the past two years: there is a 1.7-fold increase in the North-West Federal District and 3-fold increase in St. Petersburg. The share of current costs in the total expenses of St. Petersburg has also enlarged: from 16% in 2008 up to 39% in 2009 and 37% in 2010 in the North-West Federal District. The same dynamics can be observed in overhaul costs of basic assets, constructions, effluent treatment plants and rational water utilization. The share of the overhaul costs of basic assets in St. Petersburg in the total expenses of the North-West Federal District amounted to 15.42% in 2008, 34.27 in 2009 and 42.02% in 2010. This shows, on the one hand, the steady growth of capital equipment depreciation, and, on the other hand, it indicates an increase in the funds aimed at reconditioning.

Investigating the economic mechanism of water pollution regulation, it is necessary to point out the changes in legislation. The Water Code of the Russian Federation has been functioning since the beginning of 2007. It has established the key principles of water legislation, which are the basis of the regulation and implementation of water relations. In addition, the Federal Law "On Introducing Amendments to the Water Code of the Russian Federation and to the Certain Legislative Acts of the Russian Federation" N 118-FL as of 14.07.08 has made changes in the Water Code aimed at the improvement of water legislation and the strengthening of measures to protect water bodies. Payment for the use of water has become

the basic principle of economic regulation of rational water utilization and water protection.

The system of payments for water use is regulated by the Water Code of the Russian Federation, the Federal Law "On Payment for Water Bodies Use", as well as by the Government Resolution "On the adoption of the minimum and maximum fees for the use of water objects in river basins, lakes, seas and economic regions" and other standard acts. The use of water objects can be realized with withdrawal (water intake) or without it (water discharge, the use of waterways, etc.) [3].

The citizens and legal persons, who have a license for water use, should:

- ◆ pay for the use of water (water tax);
- ◆ make the payment, aimed at water rehabilitation and protection.

The payments for the use of water are allocated to the federal budget and to the budgets of the federal regions, whose water objects are used. The target payments, aimed at the water rehabilitation and protection, are allocated to the special accounts of the federal budget and to the federal regions, whose water objects are used.

The payments, aimed at water rehabilitation and protection, are taken for:

- ◆ water intake from surface water bodies within established limits;
- ◆ water withdrawal above the limit;
- ◆ the use of water bodies without water withdrawal according to the license for water use;
- ◆ the discharge of waste water of standard quality into the water bodies within the established limits.

Pollutant discharge fees are taken from the enterprises regardless of their forms of property and departmental affiliation. Regional administrations can consider the local conditions and excuse companies, organizations and institutions from the fees for pollutant discharges, produced within the maximum permissible limits for emissions and discharges. There are basic standards of fees for pollutant discharges within the established limits and rates that take into account the territorial ecological features. The increased fee is set for pollutant discharges and waste disposal above the limit; it is based on the key fee standards, the rates that take into account the territorial ecological features, and fee ratio coefficients for pollutant discharges above the limit. If there are no approved limits on pollutant discharges and waste disposal in the enterprises, then the pollutant discharge fee is taken as a payment above the limits.

Payment rates are fixed by special regulations. The procedure of pollution fee calculation depends on the kinds of standards that are used by the organization: within the acceptable standards of pollution, within the established limits of pollution or in excess of the established limits. The organizations calculate and transfer the pollution fee no later than the 20th day of the month following the reporting quarter.

Data on the payments for allowable and excessive emissions (discharges) of pollutants (waste disposal) in the North-West Federal District and in St. Petersburg are presented in *table 5*.

The data show that these payments increase both in the North-West Federal District and in St. Petersburg each year. Significant growth occurred in 2010 (there was a 3-fold increase in the North-West Federal District and 12.5-fold increase in St. Petersburg as compared with 2008). The share of the city's payments

in the total amount of the North-West Federal District has been changed: from 21% in 2009 to 75% in 2010. The principal amount of payments for allowable and excessive emissions (discharges) in the district was paid by business entities of St. Petersburg.

The payment for the use of natural resources does not excuse a nature user from environmental measures and reimbursement of environmental damage fees. As a result of the state environmental control, according to preliminary data, the budget of St. Petersburg got 20.5 million rubles fines for environmental and natural damages in 2011.

The environmental monitoring services of Hydromet fixed 1354 cases of extreme- and high-water pollution in the first half of 2011 that amounted to 95.3% of pollution in 2010. They found 11 cases of accidental pollution of water bodies (22 in 2010). There were 286 cases of extremely high water pollution (75.1% of pollution in 2010). So, water pollution has been decreased in comparison with 2010, and especially extremely high pollution has been reduced. It's a positive trend. The volume of administrative penalties for the environmental violation increased in St. Petersburg in 2010 as compared with 2008 and 2009 (it was 31% more in 2009 than in 2008 and 62% more in 2010 than in 2008).

It's necessary to have a target use of these funds. The payments, aimed at water rehabilitation and protection, should be used:

- ◆ to implement the federal and territorial government programs of water utilization, water rehabilitation and protection;
- ◆ to finance the measures relating to rational water usage, water rehabilitation and protection;
- ◆ to protect from the harmful water effects;

Table 5. Payments for allowable and excessive emissions (discharges) of pollutants (waste disposal) in the North-West Federal District and in St. Petersburg, bln. rub.

| Indicators | 2008 | 2009 | 2010 | 2010 to 2008, ± |
|---|--------|--------|--------|-----------------|
| Total amount in the North-West Federal District | 1559.1 | 2033.6 | 7249.7 | 5690.6 |
| in St. Petersburg | 256.0 | 433.6 | 5487.7 | 5231.9 |
| The same indicators, in % to the total amount in the District | 16.42 | 21.32 | 75.70 | 59.28 |

- ◆ to conduct researches and projects;
- ◆ to achieve other objectives of rational water usage, water rehabilitation and protection.

The Water Code of the Russian Federation (Art. 128) has defined some water fee benefits. For example, preferential limits of the payment size, aimed at water rehabilitation and protection, are fixed by the governmental agencies operating in the social sphere, as well as by water consumers using water in agriculture. The benefits for the water consumers, mentioned above, as well as the benefits for other categories of water users, which are allocated to the regional budgets, can be established by the laws and other normative legal acts of the Federal subjects of Russia within the limits of the sum that is allocated to their budgets.

But there are a lot of unsolved problems in this sphere. In order to address them, the Ministry of Natural Resources of the Russian Federation prepared a draft resolution “On the measures to improve the quality of wastewater” in 2008. It is aimed at the creation of the economic mechanism to promote economic entities to reduce the discharge of pollutants into water bodies. It provides for a single measure to establish such a mechanism – the manifold increase in charges for excess discharge of pollutants into water bodies.

The Ministry of Natural Resources proposes to introduce raising coefficients to the current level of payments since January 1, 2014: a 25-fold coefficient to the current level of payments and 100-fold increase in super allowed one. The payments for negative environmental impact are regulated by the 1992 and 2003 resolutions of the Government of Russia. According to the Ministry of Natural Resources, they don't meet environmental requirements, and

they can't stimulate the enterprises to engage in environmental safety. “Environmental” assessments of businesses do not cover even a tenth of necessary financial costs of environmental protection. Annual minimum one-time investment in water treatment plants across the country are estimated at 35 billion rubles. In fact, the companies paid only 4.8 billion rubles for harmful waste water in 2008.

However, the project does not consider that nonrecurrent manifold increase in excess discharge fees can provoke negative social consequences, as well as it can lead to the situation, when most enterprises won't be able to pay penalties contemplated in the project. The adoption of that resolution was stopped due to the active position of water supply organizations, regional authorities and local authorities, which estimated the possible consequences of that “economic mechanism”. In our opinion, it's impossible to solve the problem of waste water quality only by the increased payments for negative environmental impact. These issues require deeper studies, and they should be resolved at the legislative level based on the fact that the use of water resources involves the introduction and combination of environmental and economic aspects.

In conclusion we note that the task of implementing the economic mechanism of environmental protection can be achieved more successfully if some elements of the economic mechanism are regulated and implemented rationally. Nowadays the formation of a new economic mechanism of nature management and environmental financing should be an integral part of an effective system of economic management and regulation.

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