

Approach for Justification of Institutional decisions in the field of Environmental Economics

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ABSTRACT

The scientific and methodical approach to the study of institutional decisions in the field of environmental economics on the base of sustainable development principles was considered there in the paper. There was proposed an approach to determine the expediency of the decision concerning the change of a zone's of greenery purpose as an institutional decision in the field of environmental economics. There was made an analysis of the expediency to transfer a zone of greenery into the territory of another destination in Sumy city (Ukraine).

INTRODUCTION

The formation of ecologically friendly environment is the main task of urban planning. In this regard the role of zones of greenery increases as their state and the system of urban greening determine the quality of urban environment. Greening effect on health is great. Many studies of foreign and Ukrainian scientists prove that greenery reduces the impact of dust and harmful gases on human, and thus decreases the effect of pollutants on human health. Greenery contributes to the improvement of meso- and microclimate and sanitary conditions (greenery slows wind speed, keeps dust and aerosols, absorbs gas additives from the air, reduces the power of sound waves, creates a natural landscape in the city, etc.) [Kucheryavy, 2005].

Ecologically expedient planning and greening of urban areas should be considered today as a means of ecologically urban planning and means of support of conditions for sustainable development of the territory.

Given the above the authors consider the expediency of the decision concerning the change of a zone's of greenery purpose as an institutional decision in the field of environmental economics.

The goal of the paper is to improve the scientific and methodical approach to the study of institutional decisions in the field of environmental economics on the base of sustainable development principles.

DEFINITIONS

Institutional decision is a form of management decision. The main feature of institutional decisions is that they are taken to establish certain rules that will be used while making management decisions.

Institutions are clusters of rights, rules, and decision-making procedures that give rise to social practices, assign roles to participants in these practices, and govern interactions among occupants of those roles [North, 1990].

Thus, *institutional decisions* are the result of analysis, forecasting, optimization, economic evaluation and selection of alternatives to establish rules in society that affect the future of socio-economic system.

Institutional decisions in the field of environmental economics the author understands as decisions concerning establishing formal and informal norms, rules, responsibilities, procedures that determine the behaviour of entities in the field of environmental economics [Kostyuchenko, 2010].

RESEARCH RESULTS

The implementation of an institutional decision in the field of environmental economics may result in causing or preventing economic damage to the environment as a result of the implementation and functioning of the institution. Prevented damage is considered in the case of a positive effect from the implementation and functioning of the institution. In this case the effectiveness of an institutional decision can be determined as a ratio of the effect from the implementation of the institutional decision (for example, prevented economic damage from environmental pollution) and costs for its implementation and monitoring.

If the implementation of an institutional decision results in causing some economic damage, it is appropriate to determine the amount of economic damage caused by the adoption of this decision. In this case the main types of economic damage from environmental pollution can be: economic damage from excessive morbidity, economic damage to housing, economic damage to agriculture and forestry, economic damage to industry. There may be also some other types of damage depending on the specifics of institutional decisions implemented in the field of environmental economics. These types of economic damage can be estimated using popular methods [Balatsky, 2007; Tsarenko, 2002].

Thus, expediency of institutional decision-making is proposed to be justified according to the approach that is based on consideration of the prevented economic damage to the environment concerned the institutional decision-making.

Algorithm of institutional decision's justification is presented on Figure 1.

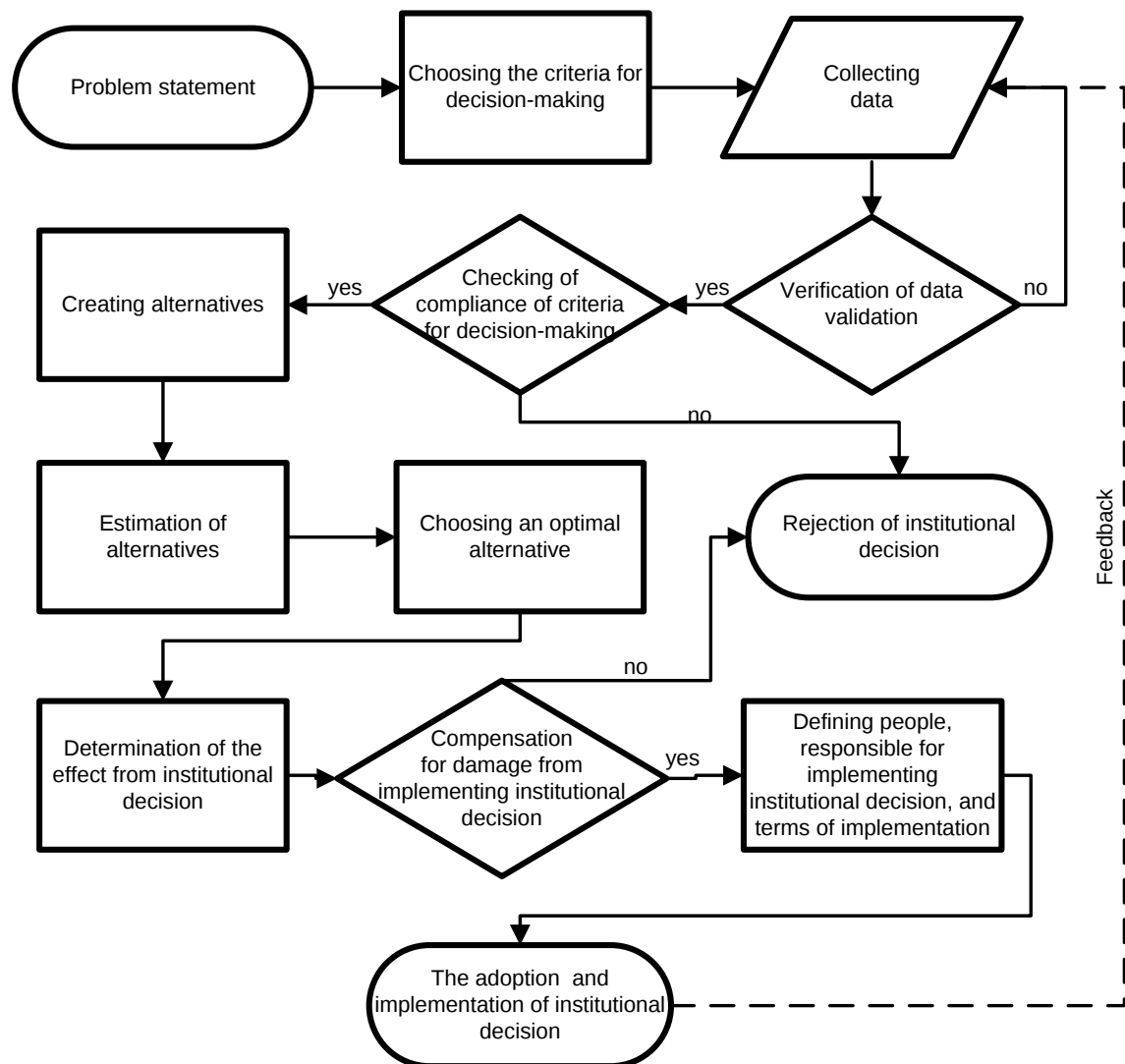


Figure 1 - Algorithm of institutional decision's justification

The authors investigate the decision concerning the change of a zone's of greenery purpose as an institutional decision in the field of environmental economics.

The basic criteria for decision-making were land belonging to the natural area with special status of protection and the minimum rate of greenery. World Health Organization recommends 50 m² of urban green space per person [Kucheryavy, 2005]. Minimum rate of greenery is established depending on national economic profile of the city and its location.

To choose the optimal alternative the economic damage from the change of a zone's of greenery purpose is determined.

The minimum economic damage from transferring a zone of greenery into the territory of another destination was taken as a criterion for the expediency of the decision concerning the change of a zone's of greenery purpose as an institutional decision in the field of environmental economics. The amount of the economic damage should be paid as compensation to the special fund of the city budget. And in future it should be used to create new zones of greenery and to support and improve the existing ones.

In case of any non-compliance of the data to the criteria institutional decision concerning the change of a zone's of greenery purpose is not accepted. In this case, one can determine the economic effect from environmental protection on the basis of prevented damage from the environmentally caused excessive morbidity.

The authors propose to determine the economic damage from transferring a zone of greenery into the territory of another destination using the formula:

$$D_3^{gr} = D_{r.d.3}^{env} + D_3^h + D_3^{wp} + D_3^{re}, \quad (1)$$

where D_3^{gr} - is economic damage from transferring a zone of greenery into the territory of another destination, UAH/ha;

$D_{r.d.3}^{env}$ - is economic damage from the environmentally caused incidence of respiratory diseases due to transferring a zone of greenery into the territory of another destination, UAH/ha;

D_3^h - is economic damage to housing due to the change of a zone's of greenery purpose, UAH/ha;

D_3^{wp} - is economic damage from the water protection zone's violation caused by reducing of green area, UAH/ha;

D_3^{re} - is economic damage from the loss of recreational effect, UAH/ha.

To calculate the economic damage from excessive morbidity and the economic damage to housing the authors propose to use existing methods [Balatsky, 2007; Tsarenko, 2002]. But it is difficult to estimate the economic damage from the loss of recreational effect and the economic damage from the water protection zone's violation. The economic damage from the loss of recreation effect includes the loss of flora and fauna, aesthetic damage, the damage as a result of impossibility of full rest, etc. The economic damage from the water protection zone's violation includes the loss of flora and fauna, the damage from soil violation, the damage from reduced water quality in reservoirs, aesthetic damage, etc.

However, due the statement that the economic damage from the deterioration of human health is 43-45% of the total economic damage from the incidence of respiratory diseases due air pollution [Mel'nyk, 2004]. All the other types of damages were taken into account through the adjusting coefficients depending on zones' of greenery location.

Thus, the economic damage from transferring a zone of greenery into the territory of another destination is proposed to calculate using the formula:

$$D^{gr} = \gamma * \frac{D_{r.d.}^{env}}{S_{gr}} \quad (2)$$

where D^{gr} - the economic damage from transferring a zone of greenery into the territory of another destination, UAH/ha;

γ - adjusting coefficient that takes the particular zone's of greenery location into account (is taken according to [DBN, 1992]);

$D_{r.d.}^{env}$ - the economic damage from the environmentally caused incidence of respiratory diseases due to transferring a zone of greenery into the territory of another destination, UAH/ha;

S_{gr} - area of greenery, ha.

The authors propose to estimate the economic damage from the environmentally caused incidence of respiratory diseases due to transferring a zone of greenery into the territory of another destination using the formula:

$$D_{r.d.}^{env} = \frac{\dot{O}_{r.d.}}{1000} * N * D_m^{av} * T, \quad (3)$$

where N - total population of the city, people;

D_m^{av} - the average damage resulting from human morbidity of the respiratory diseases, UAH;

T – the average depreciable life of buildings, years;

$\dot{O}_{r.d.}$ – the environmentally caused incidence of respiratory diseases, cases per 1000 people (to estimate $\dot{O}_{r.d.}$ the popular method is proposed [Balatsky, 1984]).

The total economic damage from transferring a zone of greenery into the territory of another destination is calculated by the formula:

$$D_{gr}^{tot} = \sum_{i=1}^n \gamma_i * \frac{D_{r.d.}^{env}}{S_{gr}}, \quad (4)$$

where D_{gr}^{tot} - total economic damage from transferring a zone of greenery into the territory of another destination, UAH/ha;

n - number of zones of greenery characterized by different location, units.

The authors made approach's approbation as a case study of institutional decision concerning the change of a zone's of greenery purpose in Sumy city, Ukraine.

The results of the approach's approbation in Sumy are presented in table 1.

Table 1 - Economic damage from the change of a zone's of greenery purpose

№	A zone of greenery	Adjusting coefficient (γ)	Economic damage (D_{gr}^{env}), UAH/ha
1	A zone of greenery located in the recreational area	1,2	7848876
2	A zone of greenery located on the coastal area	0,9	5886657
3	A zone of greenery located near the motorway	1,05	6867766
4	A zone of greenery located in the "sleeping" area	1	6540730
5	A zone of greenery located near the industrial complex: 1 st class damage 2 nd class damage	1,2 1,15	7848876 7521839

6	A zone of greenery located nearby railway junction	1,05	6867766
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According to the fact that there are no compensation payments for the change of a zone's of greenery purpose yet, the decision for a moratorium on the change of zones' of greenery purpose was made there in Sumy, Ukraine. But the decision was adopted by the city council only during the 7th voting process when there was found some balance between public interests and private and group interests of some members of the community who make decisions. The procedure of logrolling played here even more important role than economic study.

CONCLUSIONS

The proposed approach makes it possible to estimate the economic damage from the change of a zone's of greenery purpose. And in the case of a moratorium on the change of a zone's of greenery purpose the approach helps to determine the economic effect of the prevented damage to the environment.

For successful implementation of institutional decisions in the field of environmental economics political context should be taken into account. Integrated approach to the justification of institutional decisions in the field of environmental economics (which would initially take into account the possibility of their implementation) can significantly accelerate their implementation.

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