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**THE EMERGENCE OF SOCIO-ECOLOGICAL AND  
ECONOMIC DEVELOPMENT ON THE EXAMPLE OF THE  
APPLICATION OF THE FINANCIAL MECHANISM OF NATURAL  
RESOURCE MANAGEMENT**

Considering socio-ecological and economic development as a complex process based on the principles of constancy and aims at the formation of a single system, it is appropriate to emphasize the inherent nature of her property as emergence.

In the socio-ecological-economic system, the social component is in the first place, because it is humanity who needs to think about how the ecological and economic systems will function in an active human-induced intervention and it is appropriate to make a positive move in this direction. Thus, the entire responsibility for the existence of the three systems relies on the human being, and besides this, the most sensitive is the social system, by the level of vulnerability follows the ecological and the last – the economic one.

Principal provisions advocate that the properties of the system are never reduced to the sum of the properties of its elements, therefore necessarily there are so-called emergent properties that are generated by the system integrity of the object. Since the very emergence is an interconnected set of characteristics of the whole system, which are absent from its constituents, it is right to emphasize the tendency to the increasing dependence of systems on the endangered properties. These considerations allowed V.M. Petlin (2008) emphasized that integrity is not a sign of the stability of the system, its harmonious inclusion in the environment, the guarantee of its spatial and temporal conservation, although it can significantly adjust the overall quality of systems<sup>1</sup>.

The internal interaction of the elements generates the system in all its unique peculiarity, so its properties are inherently integrative. At the same time, elements inside the system are relatively independent, their close combinations and form system education.

At the same time, the first grouping of systems (in the realm of reality) is right to combine into three groups (subsystems):

- The group or social systems, where the preference is given to the person, his health (psychological, resettlement, social, aerogenic, etc.);

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<sup>1</sup> Петлін В. М. Синергетичні залежності в організації природних територіальних систем: монографія. Львів: Вид. центр ЛНУ ім. Івана Франка, 2013. 13 с.

- Group II, or ecological systems in which the natural component (biological, inorganic nature, natural, biogeocoenosis, landscape systems, etc.) predominates;

- The third group, or economic systems, has the prerogative of economic relations and includes the relationship of ownership and management, the mechanisms regulating industrial relations (technical, production, information, etc.).

In the general sense, social systems are viewed by society as a whole or by any organization or group. It can also be any one, especially in relation to the constant modeling of social relations in space and time, which is understood as reproduction of practice. They grow and evolve on three basic parameters: certain vital functions through which there is a specific human community; the territories in which these functions are carried out and the organizational structures that ensure the fulfillment of the necessary vital functions in the given territory and with a certain population (that is, the combination of the number, quality and social composition of the last).

In economic literature, the essence of the concept of "economic system" is outlined differently. Thus, F. Pryor defines the economic system as the interaction of all institutions, organizations, laws that affect the economic behavior of individuals and the results of their activities. G.B.Bashnyanin (2006) emphasizes that "the economic system is defined as the economy, the mode of production and distribution, the type of economy, the totality of economic relations and types of economic activity, etc."<sup>2</sup>. B.V. Kulchitsky defines the economic system as a system of "mechanisms and institutions that provide for the organization, production and distribution of material and spiritual goods created in society"<sup>3</sup>. And there are a lot of such interpretations. Consequently, neither the economic nor the ecological systems exist separately from each other, but, on the contrary, their development is interconnected, therefore I. Grabinsky (2000) rightly emphasizes that "the interdependence in the functioning of economic and ecological systems and their joint influence on the effectiveness of the national economy testifies to the need for their collective analysis"<sup>4</sup>.

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<sup>2</sup> Башнянин Г. І. *Метрологічні економічні системи: вступ у загальну теорію і методологію формування економічних параметрів: монографія*. Львів: Новий Світ, 2005. 62.

<sup>3</sup> Кульчицький Б. В. *Економічні системи суспільства: теорія, методологія, типологізація: монографія*. Львів: Вид. центр ЛНУ ім. Івана Франка, 2003. 17.

<sup>4</sup> Грабинський І. М. *Еколого-економічна система України: порівняльний аналіз: монографія*. Львів: НТШ, 1997.

The main reason for the need to form a socio-ecological and economic system is the contradiction between the interests of society in preserving and protecting the natural environment and the interests of economic entities aimed at maximizing profits in any way. This contradiction is due to the presence of external factors that arise in the development process of the system.

The subsystems are composed of the following components: population and its resettlement, natural resources and production components, infrastructure, various mechanisms, etc. Between them there were numerous economic, social, informational and other kinds of connections.

The emergence in the socio-ecological-economic system manifests itself in the presence of some special properties that are not inherent to its individual elements and do not amount to their sum, which leads to the impossibility of bringing the individual components of the system into a common property with the combination of its components.

The main contradiction in the formation of the socio-ecological and economic system is the discrepancy between the interests of society in preserving and protecting the natural environment and the interests of economic entities aimed at maximizing profits in any way, that is, the separate existence of social, economic and ecological systems and their constituents. This contradiction is due to the presence of both external and internal factors that determine the existence of the system and arise in the process of its development. In the proposed system, the most important dominant factor is the unity of the three components: nature, population and economy; therefore, the socio-ecological-economic system is understood as a set of interrelated elements of demographic, social, natural, industrial and institutional nature, without which the existence of a common system is impossible. The subsystems are composed of the following components: population and its resettlement, natural resource and production components, infrastructure, etc. Between them there were numerous economic, social, informational and other kinds of connections. In the course of the relevant activity of the population and the manifestation of these links, organically integral-integrated systems are formed, whose properties are not a total group of properties, which make up their subsystems. Yet, within a holistic system, their distinct livelihoods and full realization are possible only in the integration and dialectical unity, and therefore, a comprehensive study is especially relevant.

Nowadays, the management of individual social, environmental and economic processes is actively being implemented, for which economic and administrative methods are used. The methods of optimizing management

decisions that are based on the widespread use of economic and mathematical approaches, network models, automated control systems and information technologies play an important role in providing an integrated approach. They provide an opportunity to make forecasts and plan further activities. The basic approach to modeling the use of nature resources is to take into account the dynamics of interaction of three different content and forms of the components: social, environmental and economic. The study of the effect of organizational and economic regulators within the framework of the model takes place within the framework of indicators that provide an assessment of possible changes in the natural environment and society. At the same time, the main parameters of the assessment of changes in the main indicators of the three-component structure of complex nature use are presented with appropriate correction factors. In addition, by analyzing indicators that characterize the use of natural resources in certain regions, we believe that they do not take into account the peculiarities of the use of nature resources and cannot direct users to an integrated approach in attracting resources to production, therefore, it is proposed to introduce the indicated factors. Determination of ecological, social and economic subsystems necessitated consideration of each of them separately, which was determined with the help of special coefficients, respectively: ecological, social and economic equilibrium of the territory. But the process of nature use, existing in the socio-ecological-economic system, is also saturated with emergence. Given the present-day nature management, the problem of strengthening the mechanism of regulation of the development of the economy with a focus on the socio-ecological and economic direction becomes a matter of special urgency, and it is made possible by the very financial mechanism.

The financial mechanism, as an integral part of the economic mechanism of state policy, includes a set of institutional and institutional measures aimed at ensuring the formation and implementation of sustainable development policies in line with the level the functioning of productive forces and social priorities regarding the quality of the environment and the rational use of nature resources<sup>5</sup>.

The financial mechanisms of nature conservation and environmental management are divided into:

- mechanisms of the national (country) level;
- Mechanisms of the regional (area districts) level;

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<sup>5</sup> Артус М. М. *Фінансовий механізм в умовах ринкової економіки. Фінанси України. 2005. № 3. 54.*

- mechanisms of local (city and village councils, united territorial communities) level.

In the nature management of the national level, mechanisms are based on the following main types of financial revenues: the state budget (centralized funding), local budgets, loans and indicators of financial institutions, grants from international organizations. At the regional and local levels, funding sources are regional and local budgets, environmental protection funds, enterprise funds, international grants, loans, charitable aid, voluntary contributions.

At the national level, mechanisms are based on the following main types of revenues:

1. State budget (centralized financing).
2. Local budgets (within the relevant deductions).
3. Credit and loans from financial institutions (provided by national programs).
4. Grants of international organizations (provided under national programs).

The funds of the state budget are formed at the expense of:

- fees for the special use of natural resources, namely: fees for the special use of forest resources, land fees, fees for the special use of water resources, fees for special use of mineral resources;
- charges for pollution of the environment;
- fines and claims for damages caused as a result of violations of environmental legislation.

The fees for the special use of natural resources in the past years consisted of fluctuating revenues: from 64% of the planned indicators for forest resources, from 99% for land resources, 59% for special use of mineral resources. This indicates an unstable attraction of financial resources to the budgets of all levels<sup>6</sup>. At the same time, fees for the special use of natural resources coming to the local budgets and the state budget of Ukraine and should be directed at performing works on reproduction and maintaining the environment in good condition, but the current legislation does not establish clear mechanisms for the accumulation and use of funds from fees for the special use of natural resources.

With the adoption of the updated version of the Tax Code of Ukraine, the Decree of the Cabinet of Ministers of Ukraine No. 303 dated March 1, 1999, which established the payment of a fee for a certain ratio and

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<sup>6</sup> Державна служба статистики України. URL: <http://www.ukrstat.gov.ua/>

establishment of environmental pollution charges standards, expired. In Ukraine, there are now the following types of payments<sup>7</sup>:

- Rent payment – a national tax, which is charged for the use of mineral resources for the extraction of minerals; use of subsoil for purposes not related to the extraction of minerals; for using the radio-frequency resource of Ukraine; for special water use; for special use of forest resources; for transportation of oil and oil products by land oil pipelines and petroleum product pipelines, transit transportation of ammonia pipelines through Ukraine;

- Environmental tax – a national mandatory payment, which is charged on actual volumes of CO<sub>2</sub> emissions into the air, discharges into water bodies of pollutants, waste placement, actual amount of radioactive waste temporarily stored by their producers, actual volume of generated radioactive waste and the actual amount of radioactive waste accumulated before April 1, 2009.

Regarding the existing regulations on the use of nature resources, we fully agree with the opinion of V.A. Golan, who points out that these approaches are backward and do not meet modern requirements. "In the context of decentralization of power and local self-government reform, when the center of gravity in the management of socio-economic processes is gradually moving to the level of the territorial community, the improvement of the methodological support for the collection of taxes (fees) for special use of natural resources is one of the prerequisites for strengthening the financial self-sufficiency of territorial entities"<sup>8</sup>.

In the dynamics of revenues from fees for special use of natural resources to the State Budget of Ukraine for the period from 1999 to 2014, there was a positive trend. And if in 1999 the share of fees was 4.61%, and in 2002 – 3,96%, then in 2007 it dropped to 2,71%. This is due to an increase in direct and indirect taxes to various levels of budgets, linked to the active pursuit of entrepreneurial activity and the creation of added value. In the period from 2007 to 2009, the share of natural resources payments to the State Budget of Ukraine increased to 4,12%, coinciding with the time of the global financial crisis and at the level of the national economy, led to curtailment of business activity and decrease of income from the vast majority of business entities. For the period from 2010 to 2014, with the exception of 2011, the share of revenues increased dramatically (to 7,37%) due to a sharp increase in the absolute value of fees for the special use of

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<sup>7</sup> Податковий кодекс України: Закон України від 02.12.2010 р. № 2755-VI. Дата оновлення: 01.03.2019. URL: <https://zakon.rada.gov.ua/laws/show/2755-17>

<sup>8</sup> Голан В.А. Плата за природні ресурси в умовах децентралізації: інвестиційний аспект. Інвестиції: практика та досвід. 2016. №7. 8.

natural resources in connection with the assignment of rent to their composition for oil, natural gas and gas condensate produced in Ukraine. In 2015 and 2016, the indicator remains almost unchanged – respectively 7,44 and 7,15%, and from 2017 there is a sharp decrease in the share of rent and fees for the use of other natural resources to 4,88%<sup>9</sup>. An important factor in regulating the processes of extraction of mineral resources and a significant budget supplementing factor is the system of fiscal regulation of subsoil use, which is presented by payment, and from 2015, by rent, for the use of subsoil. This payment today is a synthetic payment, which actually accumulated the fee for exploration works carried out at the expense of the State Budget of Ukraine, and rent for the extraction of hydrocarbon raw materials.

The funds of environmental protection funds make up the basis of financing environmental programs at the regional and local levels. However, at the local level, there is a dispersal of funds between a large number of small funds, which does not allow for the financing of practical measures to eliminate and reduce pollution. In the face of a country's lack of financial capacity, this can not be justified. Funds of the environmental protection of all levels are the basic mechanism of state financing of environmental programs. The State Fund for the Protection of the Environment is an integral part of the State Budget of Ukraine. The Fund was created with the purpose of concentration of funds and targeted financing of environmental and resource-saving measures related to environmental protection aimed at preventing, reducing and eliminating environmental pollution, including financing research on these issues. The Fund is formed at the expense of the fees for pollution of the environment and other funds, determined by the legislation. The main spending unit of the Fund is the Ministry of Natural Resources of Ukraine. The funds of the Institution are directed to financing environmental and resource-saving measures that are in line with the main directions of state policy in the field of environmental protection, use of natural resources and ensuring environmental safety. The funds of the Institution are used within the limits of budgetary programs, determined by the legislation, according to the estimates of incomes and expenses, which are approved by the Minister of Ecology and Natural Resources in agreement with the Ministry of Finance. The lists of environmental protection measures within the framework of the budget programs of the Fund are approved by the Cabinet of Ministers of Ukraine on the submission of the Ministry of Environmental Resources. Up to 10% of the Fund's funds may be reserved for unforeseen environmental protection

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<sup>9</sup> Державна служба статистики України. URL: <http://www.ukrstat.gov.ua/>

related expenditures that are not permanent and could not be foreseen when drafting the draft State Budget of Ukraine<sup>10</sup>.

The application of existing mechanisms for financing environmental projects of territorial communities at the local level is based on current legislation on environmental protection and the Budget Code, as well as regulations on the formation and distribution of funds of the consolidated budget of Ukraine. The attraction of funds through the central (state) budget is carried out in accordance with the Law on the State Budget of Ukraine for the current year and the Budget Code. That is, attracting additional financial resources or redistributing within the limits of the respective limits is very difficult. The distribution of funds through the State Fund for the Protection of the Environment is carried out in accordance with the Regulation on the Fund (Cabinet Resolution Ministers of Ukraine dated February 15, 2002 No. 181) and the Procedure for filing requests for the allocation of funds from the State Fund for Environmental Protection (Order of the Ministry of Natural Resources of Ukraine dated May 21, 2002, No. 189). Filing of applications for financing should be in line with the List of activities that belong to environmental protection measures approved by the Resolution of the Cabinet of Ministers of Ukraine of September 17, 1996, No. 1147, as amended by the Resolution of the Cabinet of Ministers of Ukraine of November 17, 2001 No. 1519. Currently, actual accumulation of funds is possible on the accounts of local Funds, but the lack of clear management of these Funds as legal entities does not allow for doing it transparently. In the conditions of obtaining grants or charitable contributions to local budgets (which, in fact, is the local Environmental Protection Fund), the community will act as the manager of these funds only through appropriate Councils in accordance with the current legislation. The financing of environmental programs using budget accounts has certain difficulties and limitations. In particular, paragraph 2 of Part 3 of Art. 13 of the Budget Code of Ukraine stipulates that grants or gifts received by budget funds managers for a specific purpose shall be included in the special budget fund. In addition, the Revenues list of budget institutions and organizations, approved by the Decree of the Ministry of Finance of Ukraine of June 29, 2000, No. 146, includes charitable contributions and donations received by budget institutions and organizations (Section III, Clause 8), to own revenues of budget institutions, and Item 18 of Art. 8th and 4th cc. 47 of the Law of Ukraine dated December 20, 2001, No. 2905-III "On the State Budget of Ukraine for 2002", in turn, establish that own receipts of budgetary

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<sup>10</sup> Балджи М.Д., Харічков С.К. *Метрoлoгiя соціo-екологo-економiчних систем: монографiя. Одеса: ИПРЕЕД НАН України, 2010. 124.*



institutions held at the expense of the corresponding budget are the source of the formation of a special fund both of the State and local budget<sup>11</sup>.

In the case of assignation of a grant to a local public administration, the funds of the grant will be credited and used through the system of treasury accounts. According to clause 11.1. The Procedure for Implementation of the State Budget for Income, approved by the Order of the State Treasury of Ukraine of December 19, 2000, No. 131, the own receipts of such institutions are credited to special registration accounts opened in offices or departments of the State Treasury at the place of service. On the other hand, in accordance with the Treasury Service Provision for Local Budget Revenues and the Intergovernmental Transfers, approved by the Order The State Treasury of Ukraine as of January 31, 2002, No. 17, own receipts of administrators, which are held at the expense of local budgets, are credited to accounts opened in banks' institutions on behalf of funds managers. Thus, the enrollment of charitable funds on budget accounts of state institutions does not ensure the transparency of their use for target needs. The system of funds management, established within the State Treasury, assumes, under certain conditions, the misuse of these funds. In addition, the organization of accounting and control created by the State Treasury significantly complicates the maintenance of accounts and prevents mobile use of funds for current needs in order to maximize the effective implementation of environmental protection programs, which may change in comparison with previous plans.

Another source of funding for regional and local environmental projects is the company's own funds. Since the mid-1990s, the corresponding costs amounted to over 96% of the total amount of environmental protection costs. In the structure of expenses for environmental protection, the largest share is occupied by current expenditures – more than 80%, much less is converted to capital investments and overhaul – about 15-18%. On the other hand, the list of taxpayers includes only enterprises engaged in production activities on a large scale. But now are formed a lot of small businesses and firms, which at registration indicate all possible activities, and which is currently not possible to determine. It is these enterprises that violate all the requirements of the environmental legislation, pollute the environment, are not controlled by the state authorities and do not pay the pollution fees. Large enterprises included in the list of tax payers are long-term debtors of the fund. But to extinguish the debt in the form of providing technical assistance, assistance

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<sup>11</sup> Білобран О. *Управління у сфері охорони довкілля та природокористування в Україні: проблеми та шляхи їх вирішення монографія*. Київ: ВЕГО "МАМА-86", 2003. 128.

materials, human resources to solve environmental problems is prohibited. In the case when the debtor company is redeemable or a new (even a similar type of activity) debt is created, the fund's debts "disappear"<sup>12</sup>.

One of the possible ways of attracting financial resources for implementation of environmental programs at the regional and local levels is obtaining loans through banking institutions. Another way to credit resources is to use the opportunities of credit unions that are active in Ukraine. In particular, creating a prerequisite for the accumulation of funds for the implementation of a nature conservation project is possible by creating a credit union on an independent basis or as a branch of an already existing union and involving the relevant resources. Creating a credit union can be initiated by local authorities, public organizations or small businesses. The main thing is to have an indisputable uniting goals and real ideas of solving a set of environmental problems.

One of the least developed at the practical and methodical level is the way of attracting domestic investment through voluntary donations of the population or through the accumulation of funds coming to local ecological funds. The latter method has proved to be realistic relatively recently, but it still does not have a clear organizational and administrative mechanism for implementation. Therefore, under the current conditions, accumulation of funds on the accounts of environmental funds is not yet completely safe for the storage, because these funds, as noted above, are part of the budgets of the respective levels and are administered by the State Treasury.

Grants of international charitable organizations may become one of the types of voluntary donations to finance environmental projects at the regional and local levels, but appropriate guidelines should be created for them to be obtained – from a qualified team of executives and applicants to institutional and organizational conditions for the effective implementation of the project. According to incomplete data for 1997-2000, Ukraine received international technical assistance in the free-converted currency equivalent to UAH 200.34 million, in the period from 2015 to 2018 - UAH 512 million. However, this assistance was not predominantly of an investment nature. By comparison, in 2001, only current expenditures from all sources of income in Ukraine exceeded UAH 2.6 billion, capital investments amounted to UAH 380.0 million, overhaul – UAH 240.0 million<sup>13</sup>.

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<sup>12</sup> Білобран О. *Управління у сфері охорони довкілля та природокористування в Україні: проблеми та шляхи їх вирішення монографія*. Київ: ВЕГО "МАМА-86", 2003. 129.

<sup>13</sup> Державна служба статистики України. URL: <http://www.ukrstat.gov.ua/>

Consequently, the situation at the time of establishing financial mechanisms for the targeted attraction of funds for the implementation of environmental projects and a substantial revision of existing mechanisms to radically improve their effectiveness. The community has a great potential at the local level, which is still little used, mostly occasionally. At the national level, great potential is to create leverage for the redistribution of funds from polluters and users of natural resources, with the aim of bringing rates and payment standards to a level that corresponds both to real profits and the cost of compensatory measures for disposal pollution, in accordance with the priorities of environmental protection and the implementation of the principles of sustainable development<sup>14</sup>.

The current financial mechanism in the use of nature resources requires the improvement and regulation of the use of natural resources, aimed at ensuring the redistribution of rent in the interests of the owner of natural resources, which by Constitution stand's the population. Increasing the revenues of the natural resource rent to the Consolidated Budget of Ukraine will become possible only by a radical revision of existing approaches and the social basis for the accrual of certain types of fees (rent) for the special use of natural resources.

The process of environmental management in the socio-ecological-economic system, like any other process is associated with natural resources, is an example of a systemic effect on a large scale. As a whole, management regulates and establishes relative prices for the use of certain resources, pollution, etc., and does not have the benefits of attracting a particular resource or focusing on a particular pollutant that affects the socio-ecological and economic system; there is no point at which to control the functioning of the system. So it is about the people who form the trend, everything and the process turns out to be emergent. And the ability to control this process by several people contradicts the considerations of the theory of information. Thus, with the help of the phenomenon of emergence, it is possible to efficiently interpret and investigate the peculiarities of the functioning of complex systems (which may include most of the processes that modern people interact with), which cannot be explained from the point of view of information to certain parts, especially it becomes possible with the help of the financial mechanism.

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<sup>14</sup> Білобран О. *Управління у сфері охорони довкілля та природокористування в Україні: проблеми та шляхи їх вирішення монографія*. Київ: ВЕГО "МАМА-86", 2003. 131.