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ECOLOGICAL CONFLICTS IN MODERN SYSTEM OF NATURE USE: THEORETICAL AND METHODOLOGICAL ASPECTS

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The problems of determination of ecological conflict in the overall system of ecological and economic security are researched. The relationship of ecological conflict with resource regimes are defined, subject and object are characterized. Based on the analysis of classifications of conflict author's typology of ecological conflict is molded. Positive and negative functions of environmental conflict, methods and tools to resolve it are identified.

Keywords: deficit, ecological conflict, effect, method of setting, natural resource.

Introduction: Basic Definitions of Ecological Conflict

Ecological conflicts (EC) as a social phenomenon arise up during all the history of "society – environment – economics" system existence and it has such personal characteristics:

- on the one hand, EC has the same essence characteristics and development mechanism as any social conflict has [1];
- on the other hand, EC has specific features inherent only for EC: subject and object; origin process, EC development and solving; EC consequences.

As for EC its subject is the problem of natural resource (ecological value) possession or controlling it, that can cause certain benefits (not obligatory financial) to one or more individuals. EC object is a natural resource or ecological value which due to certain circumstances is on the interests crossing of different social or economical individuals who aspire to possession or controlling it. Thus, *ecological conflict* is opposition on governmental and/or intergovernmental levels, caused by incompatible or hostile interests of one or more individuals and by their fight for the natural resources ownership, use (distributing) or their controlling right, accompanied by possible using of violent methods for the aim achievement.

EC socio-economic nature, its subject, object and development dynamics research shows that:

1) both resource deficit and surplus can be potential EC sources;
2) EC can be provoked (or can be the result) by the unequal natural resource access possibilities, its distributing and quality.

Process of EC origin and development, caused by a resource deficit (limitation), is presented in figure 1.

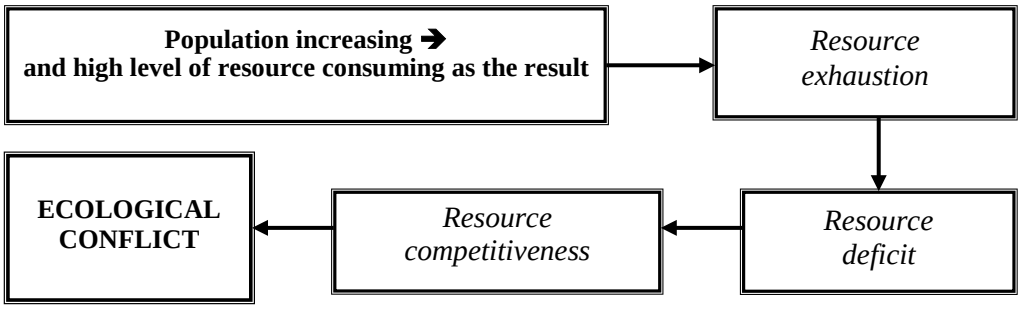

Figure 1. EC origin and development, caused by resource deficit

Capacity for EC solving, guided by resource deficit, is presented in figure 2. As it is shown, due to achievement of sustainable development (SD) aim, the basic role in the EC solving mechanism offered is given to the market instruments (using the market prices on resources) and innovations (technologies and using of resources substitutes).

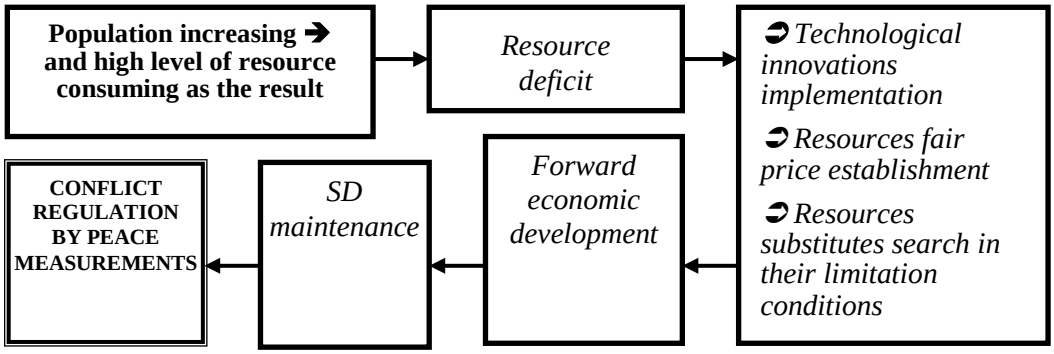

Figure 2. EC solving mechanism, guided by resources deficit, due to achievement of SD aim

Ecological and economic analysis guided by EC surplus [2; 3; 4] allows allocating such basic factors of its origin:

- *motivation* – aspiration due to the conflict to get complete (or partial) control on the payments for the natural resources sale or using;
- *financial means* – conflict financing due to the controlled payments for the natural resources using;
- *indirect effects* – natural resources surplus can provoke negative economic and political effects, for example, non-effective management, slow economy growth, political instability, weak state institutes, social inequality, etc.

Questions and problems associated with fundamentals of SD are an essential part of the "Millennium Development Goals" [5]. Strategic goals of development can be formulated as follows:

1) priority of environmental measures in policy making and national programs;
2) reduction in depletion of ecological resources;
3) improved access to ecological services.

1. Typology of Ecological Conflict. Effects of Ecological Contradictions

Ecological consequences of globalization such as trans-boundary pollution, solid and liquid wastes, ozone layer depletion, negative ecological aspects of international trade, resource depletion and ocean pollution require adequate approaches and mechanisms. Extensive use of ecosystems in modern technological processes is one of the major sources of potential EC (or the so-called "resource conflicts") which have already become visible at a regional level and very soon can become a global phenomenon [6; 7; 8].

Resource conflicts can be subdivided into 7 groups: 1) land conflicts; 2) water conflicts; 3) forest conflicts; 4) mineral conflicts; 5) food conflicts; 6) assimilation conflicts; 7) complex conflicts (brief description of this classification is presented in table 1; for details, see: [1; 9; 10].

Ecological and economic effects and costs in EC. Research of new possibilities of socio-economic growth for competitive industrial societies is characterized as well as it allows defining the origin of serious contradictions. On the one hand, economic agents fill the obvious necessity of the any competitiveness using for a receipt, foremost, economic benefits, on the other – a cardinal revision is required by the systems and mechanisms of redistribution of effects between subjects in socio-economic systems. Forming of competitive edges by economic subjects takes a place in two basic directions:

1) progressive, is based on modern achievements of science and techniques (technologies)
2) resource, is based on the use of natural resource potential.

In both cases competitive activity and behavior of economic agents on the resources markets acquire the distinct signs of conflict, as a result there is an EC, in basis of which is a conflict of interests, related to the redistribution of socio-ecology-economic effects between the owner of resource, mediator, producer and final consumer.

As a key factor of EC origin in the field of nature use *there* is *an ownership right* on a natural resource. The access modes, managements and resource use, characteristic for the socio-economic system, form rights, possibilities and responsibility of nature use agents.

Table 1 Brief description of EC

Conflict type	*Conflict causes*	*Conflict content*	*Examples*	*Conflict resolution*
Land conflict	▪ Issues related to the property rights ▪ Unresolved questions related to territorial frontiers ▪ Imperfect legislation ▪ Property rights associated with exhaustible resources as a consequence of territorial issues ▪ Population growth, poverty, aggressiveness	Conflict over possession/ control over certain territory and/or natural resources which can bring direct or indirect profits	1. Conflict between Ukraine and Romania over the Island Zmeinyy (Ukraine has found considerable oil reserves in the adjacent shelf). 2. Conflict between Japan and Russia over the Kurily Islands (Japan considers the islands to be their territory)	Political, institutional, civil, technological, cultural, market methods of conflict resolution
Water conflict	▪ Issues related to the property rights ▪ Intensive use of water resource by one party ▪ Trans-boundary water pollution ▪ Restricted access to water resources	Conflict over possession/ control over water resources which can bring direct or indirect profit: financial, technological, social, territorial profits	1. Permanent conflicts between Ukraine and Romania over trans-boundary pollution of river Siret by Romanian mines. 2. Trans-boundary pollution of the river Prypyat (Ukraine – Byelorussia)	Political, institutional, market methods of conflict resolution
Forest conflict	▪ Issues related to the property rights ▪ Ecological and social consequences of deforestation ▪ Distribution of profits from sale of timber ▪ Imperfect legislation	Conflict over possession/ control over forest resources which, as a rule, can bring financial, social profits and advantages in armed conflicts	1. Timber as a source of financing national and regional conflicts (Burma, Congo, Liberia, Cote d'Ivoire, Cambodia). 2. Forest as ecosystem and natural habitat for local population (Mexico, Brazil, Venezuela, Indonesia, India, Nepal)	Civil, institutional, technological, and market methods of conflict resolution
Mineral conflict	▪ Access to, control over and trade of mineral resources ▪ Mineral resources ownership as a factor of financial influence ▪ Conflict of interests between mining companies and local population ▪ Macroeconomic dependence on mineral resources, an increase in social and economic vulnerability ▪ Corruption and obstacles to economic development caused by availability of mineral resources and poor control	Conflict over possession/ control over mineral resources which as a rule can bring financial and social profits	1. Most of armed conflicts in Western Africa, (Congo, Angola, Rwanda, Sierra Leone, Liberia – diamonds, gold; Togo – phosphates), Papua New Guinea, Tanzania, South Africa, Zimbabwe, Peru - ore. 2. Armed conflicts in the Middle East (Kuwait, Iraq – oil)	Political, institutional, civil, technological, cultural, market methods of conflict resolution
Food conflict	▪ Scarcity of land resources (arable land, pastures etc.) ▪ Closed economic systems ▪ Lack of appropriate technologies for land cultivation ▪ Lack of harvesting ▪ Poor climatic, weather conditions ▪ Low living standards	Conflict over possession of necessary resources, technologies which as a rule can bring financial and social profits	1. Catastrophic shortage of food in the countries of Central Africa (Somali, Chad, Sudan), South-eastern Asia (Northern Korea). 2. Permanent food crisis caused by ecological disasters (countries of Africa, South-eastern Asia). 3. Trade embargo caused by the armed conflicts (Afghanistan, Iraq)	Political, institutional, civil, technological, cultural, market methods of conflict resolution
Assimilation conflict	▪ Ecosystem assimilation capacity ▪ Imperfect legislation related to trans-boundary pollution ▪ Failure to apply tradable pollution permits	Conflict over possession of necessary resources, technologies which as a rule can bring financial and social profits	1. Greenhouse effect. 2. Trans-boundary pollution caused by the man-made disasters (Chernobyl catastrophe, Bhopal) 3. Uncontrolled deforestation (Transcarpathian forests, Brazilian rainforests)	Political, institutional, civil, technological, cultural, market methods of conflict resolution

Intensity, development dynamics and methods of EC settlement, origin reason of which is a right of ownership on a natural resource, depend on the features of economic and legislative relations of nature use agents of in a chain "to own – to dispose – to utilize":

State	↔	State
State	↔	Economic agent (enterprise/firm)
State	↔	Individual
Economic agent (enterprise/firm)	↔	Economic agent (enterprise/firm)
Economic agent (enterprise/firm)	↔	Individual
Individual	↔	Individual

Problem of ownership rights on a natural resource and risks of EC origin in the system "state – economic agent – individual" are determined by the mechanisms of acquisition of such right and it further use. Procedures of the legislative fixing of ownership rights, their purchase and transmission/delegation are most controversial in this connection.

Acceptability of results of EC settlement determined by distributing between the conflicting sides of additional effects (△B) and costs (△C).

Effects (△B) can be grouped as follows:

a) economic (profit, income, rent, potential benefits from resource possessing, possibilities of resource management, development of production infrastructure, investments, creation of workplaces etc.);
b) social (maintenance of certain social level and living standard, development of social infrastructure, providing of social safety, decline of unemployment rate, etc.);
c) ecological (maintenance of naturally-resource potential, ecological safety, material well-being by resources, use of ecological functions of natural resource, settlement of questions of cross-border pollution, etc.);
d) political (settlement of territorial disputes and claims, differentiating of economic activity conduct areas (territories), development of cross-border/international collaboration, international image, etc.);
other types of effects, for example, institutional, technological, legal.

Costs (expenses) (△C), related to EC, are distributed on such basic directions:

- guard and renewal of natural resource (atmosphere, water, soil, bio-resources);
- maintenance of socio-economic level development (production, consumption, infrastructure, standard of living, health protection);
- search and bringing in of alternative resources sources or technologies because of exhaustion of natural resource potential and/or low quality of resource;
- finding and development of difficult deposits of minerals because of exhaustion superficial and accessible;
- technique and technological modernization of raw materials processing technologies;
- EC settlement;
- finding of new territories, suitable for vital functions, because of its loss/reduction because of EC (submergence, felling, degradation of soils, etc.);
- receiving less of economic value (slowing down of economic development, receiving less of GDP, reduction of workplaces, etc.);
- problems of opportunity costs and long-term ecology-economical decisions making.

Consequently, main problems, the successful and adequate decision of which is able substantially to influence on efficiency of already existing EC settlement and to reduce conflict potential of economic agents conduct in the conditions of resources limitations are ownership rights on natural resources and readiness of economic agents to resource limitations (to receiving less of resource, profit, potential

benefits, social effects).

2. Global Economic and Environmental Policy: in Compromise

The beginning of the third millennium is characterized by strengthening of negative tendencies in social and economic development caused by globalization of world economic relations and transformation of social relations. Production and demonstration of qualitative new global problems and challenges is characteristic for post-industrial economy: ecological factor is becoming determining in the formation of world social and economic, and political dynamics.

Three groups of global problems can be marked out: international social and political; international social and economic; ecological and human problems. The peculiarities of global ecological problems are:
1) global development of a number of negative tendencies in nature;
2) development according to exponential laws;
3) reliability of society management systems owing to possibility of adoption of cardinal solutions by a narrow circle of people [11, p. 23–25].

Contradictions, that appear in the whole system of economic relations in connection with the use of natural resources and ecological goods lead to EC. Nowadays global character of ecological problems is determined by the key directions:
1) *biodiversity conservation*;
2) rational use and protection of *water resources, problems of trans-boundary water resource management*;
3) problems bound up with impact and change of *climate resources;*
4) use of *land resources;*
5) disturbance of atmosphere *assimilation potential*;
6) problems of use and *protection of forest resources*;
7) problems of provision of common *resource safety*;
8) provision of *ecological safety* of economic enterprises and units;
9) *ecological problems of military sphere conversion*;
10) *"ecological discrimination"* as unequal access to main natural resources.

Mentioned ecological problems are characterized by a considerable conflict potential. In our opinion, key role of ecological factor on the modern stage of international cooperation development is determined by the following:

- in conditions of sustainable transition to post-industrial society ecological factor through ecologization of political processes is getting political character. As a result, ecologically oriented political space (eco-space) is being formed. Eco-space is becoming an inseparable element of national safety and determines tendencies of global international safety system;
- processes of globalization and strengthening of international cooperation arouse ecological function of the state, which task is provision of ecological safety, creating and supporting optimal conditions for life. Ecological state policy is an efficient instrument. Foreign state policy (especially of economically developed countries) is becoming a security means of national interests. In the nearest future high conflict potential of eco-politics can lead to origin and development of many international EC – water, mineral, land, assimilation, food [12; 13];
- ecological contradictions and conflicts are serious destabilizing geopolitical factors. Ecodestructive manifestation of conflict factor is characterized by such basic directions as: scarcity of main raw materials (water, oil, gas, mineral raw materials); scarcity of territories (economic space), useful for living and economic activity; destruction of biodiversity (flora, fauna, ecological functions of ecosystems); increase of population number (demographic pressure on scarce natural resources); ecoimperialism, as means for provision of ecological and national safety by separate states (implementation of aggressive ecological policy directed at capture of ecological goods or their disposal is a direct way to EC).

3. Approaches to Setting of EC: Economic, Legal and Organizational Instruments

Environmental problems and questions of rational nature use play an important role in international and

national environmental policy. The environment as the main resource of SD should be integrated and play the key role in decision-making processes, that are directed to reduction of natural resources losses. First of all, it concern to such strategically important environmental resources, as water, land, forest, bio-resources. Connection between these actual tasks for the nearest future is improvement of the rational nature use policy through the economic and legislative mechanisms, especially its national and international aspects coordination.

Economic and legislative methods of EC setting could have the following orientation:
1) *political* (inter-state agreement, arrangements, joint plans/scenarios);
2) *institutional* (specifications, legal and legislative documents, rules);
3) *technological* (norms, standards, limits, manufactures moving, new technologies implementing);
4) *financial and economic* (tariff and non-tariff regulation, financial flows re-distribution, financial aid, compensation, subsidies);
5) *trade* (licensing, limitation, restrictions);
6) *innovative and informational* (meeting levels of social and economical development, exchange of knowledge, experience and skills, ecological education, access to information, propaganda, consultations);
7) *social and cultural* (common environmental interests, life level increasing, social support).

EC as phenomenon carries out both negative and positive functions in social and economic systems (figure 3).

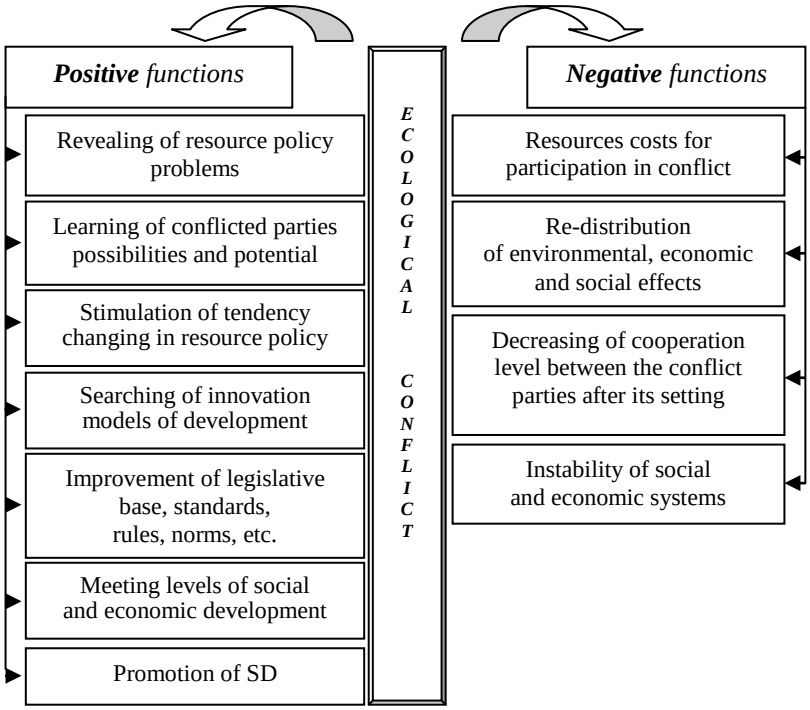

Figure 3. Ecological conflict functions

Efficient methods of EC setting depending on the EC level are presented in table 2.

Table 2 Methods of EC setting

Level / Method	*Local*	*Regional*	*International*
Political	**–**	**+ / –**	**+**
Institutional	**+**	**+**	**+**
Financial and economic	**+**	**+**	**+**
Technical and technological	**+**	**+**	**+ / –**
Informational	**+**	**+**	**+**
Social and cultural	**+**	**+**	**+ / –**

Conclusion

EC remain rather urgent for industrially developed countries as well since their geopolitical and economic interests include cooperation with developing countries. Further development will cause an increase and intensification of economic interests, correlation and penetration of production and capital including new forms and subject matter. That is why international cooperation can and must prevent and/or resolve EC with the goal of restoring ecological and economic balance on the global development.

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Екологічні конфлікти у сучасній системі природокористування: теоретичні й методологічні аспекти

Формування ефективної системи природокористування і впровадження принципів сталого розвитку у практику суспільних відносин потребують, перш за все, удосконалення концепції природокористування. Підтримка та покращання стану довкілля – це тільки попередня умова досягнення сталого розвитку, включаючи безпеку та зростання соціальних стандартів. Однак вже сьогодні екосистеми відчувають досить серйозний вплив чинників обмежуючого характеру, які становлять суттєві загрози ефективному вирішенню завдань сталого соціально-економічного розвитку. Обмеженість природних ресурсів, підсилена нерівномірним їх розподілом, нерівним доступом до них, а також несприятливими економічними, соціальними і культурно-історичними чинниками, є причиною екологічних конфліктів.

Важливою фундаментальною проблемою вивчення екологічного конфлікту є його детермінація, пов’язана із дослідженням його природи та визначення таких характеристик, як предмет, об’єкт, динаміка, типологія та методи врегулювання. На основі критичного аналізу основних економіко-екологічних і соціальних протиріч досліджено основні теоретико-методологічні аспекти екологічної конфліктології, а саме: питання детермінації екологічного конфлікту у загальній системі еколого-економічної безпеки; предмет і об'єкт екологічного конфлікту; характеристику взаємозв'язків екологічного конфлікту із ресурсними режимами. На основі аналізу класифікаційних ознак конфліктів сформовано авторську типологію екологічного конфлікту, визначено його негативні і позитивні функції, а також запропоновано відповідні методи й інструментарій його врегулювання.

Виснаження природно-ресурсного потенціалу і, як наслідок, зменшення багатства нації матимуть непередбачувані негативні наслідки для еколого-економічних систем вже у найближчій перспективі. Саме з цих позицій стратегічним завданням учасників ринку є вироблення консолідованого підходу до запобігання (вирішення) екологічних конфліктів, який би ґрунтувався на адекватних і найбільш ефективних механізмах їх врегулювання і забезпечував реалізацію визначених імперативів сталого розвитку.

Ключові слова: дефіцит, екологічний конфлікт, ефект, інструментарій, методи врегулювання, природний ресурс.