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Sumy State University  
Sumy Regional Organisation of Green Party  
Economic Research Centre  
Youth NGO "ECO"

6<sup>th</sup> International Students Conference

**"Economics for Ecology"**

Sumy, Ukraine,  
April 23-26, 1999



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**"Економіка для екології"**

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**The conference organisers:** Sumy State University (Department of Economics, Department of Ecology)  
Sumy Regional Organisation of Green Party  
Economic Research Centre  
Youth NGO "ECO"

**The official sponsors:** JSC "UkrRosMetal" (Sumy, Ukraine)  
Sumy State University

**The topics of the conference:**

- theoretical problems
- case studies
- methodology
- co-operation examples
- environmental education
- NGO activities
- and so on

**The conference is directed to** students, young researchers, representatives of youth organisations and NGOs

**Conference language:** the official conference language is English

**Conference place:** Sumy State University

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<b>Aleksandr Teletov</b>	Doctor, Prorector of Sumy State University
<b>Leonid Melnik</b>	Professor, Head of the Department of Economics, Sumy State University, President of Economic Research Centre
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<b>Irina Fedorenko</b>	Workshop leader
<b>Olga Melnik</b>	Workshop leader
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**PROGRAMME OF THE INTERNATIONAL STUDENTS CONFERENCE****"ECONOMICS FOR ECOLOGY"**

April 23-26, 1999

Sumy, Ukraine

**Friday, 23**

9.00 – 16.00	Registration of participants
14.00 – 16.00	Sightseeing Sumy
16.30	Departure to the conference place
17.00 – 18.00	Accommodation
18.30 – 19.00	Supper
20.00 – 23.00	Ukrainian party

**Saturday, 24**

8.30 – 9.00	Breakfast
9.15	Departure to Sumy State University
10.00 – 13.00	Opening ceremony
13.00 – 14.00	Lunch
14.00 – 17.30	Reports
18.00	Departure to the conference place
18.30 – 19.00	Supper
20.00 – 23.00	International party

**Sunday, 25**

8.30 – 9.00	Breakfast
9.30 – 11.00	Workshops
11.00 – 11.20	Coffee break
11.30 – 13.00	Workshops
13.00 – 14.00	Lunch
14.00 – 18.00	Workshops presentation, farewell speech
18.30 – 19.00	Supper
20.00 – 23.00	Farewell party

**Monday, 26**

8.30 – 9.00	Breakfast
10.30	Departure

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## Economy and Environment

*Grigoriy Dashutin, Leader of Sumy Regional Organisation of Green Party, Ukraine*

The problem of the waste products transformation into the profit has never been solved in the Ukraine properly. "We are a rich country and we do not need to gather rubbish", – the persons thought, from whom depends on the adoption of this decision in Soviet times. "We are so poor, that we can't care about the environment", – repeat their successors today. But at the same time in the well-developed countries nothing has wasted, if it is possible to get the least profit. The waste products remaking is considered the good business and the state supports it in every possible way.

The development of the ecological clean enterprises raises two inseparable tasks: the achievement of the economical profit simultaneously keeping the man's interest and preserving the environment's quality. Here there are two important moments: the economical substantiation of this project and its ecological cleanness. Introducing the nature-protecting production it is impossible to do much damage to the environment, then we do it today. But as we speak about the drawing of the new technologies, which must give the real profit, so the result will be anyway better.

All the Europe and the rest well-developed countries make their business remaking the waste products. In the Ukraine such a business keeps at a long now. But it doesn't mean that there is no possibility to work in this direction in our country. At present day a lot of employers and manufactures are the members of Green Party. But their attitude to the environment isn't perfect. Now more Ukrainian employers understand the economical prospects, which can give the waste remaking or, for example, refinement the drinking water till the standard when it is possible to use it as ecological clean.

European "Greens" have proved, that for achievement a steady economical development the first task is to protect the environment, the social spheres, health and well-being of the people. So defending friendly economical development to ecology European "Greens" earn the political, economical marks and the rest, which it is possible to earn in this direction.

## Ecological Features of the Coming Economic Society

Prof. Leonid Melnik, Head of the Department of Economics,  
Sumy State University, Ukraine

A social-economic system to which society is moving now can be called the *information society*.

The general features of the situation where the outlines of the "information society" can be formulated are depicted very evidently by K. Boulding as the "economics of a spaceman".

The main peculiarities of the information society can be described as the following.

*Information* becomes the key natural factor the social production is concentrated on. Information is only Natural substance extraction of which from the environment doesn't make a direct damage to nature. More over it saves from the extraction the materials and power from environment to a considerable extent.

The efficiency of the process of the natural metabolism is several times higher then the productional processes. But the main thing is the fact that nature lives through closed cycles. Here the every link is the continuation of the previous one and the beginning of the next one.

"*Socio-*" has all chances to become a leader of the man's triad. "*Socio-*" appears from "*labour-*" so as in its terms "*labour-*" has appeared from "*bio-*". Unlike the two last human's subsystems his "*socio-*" uses only the information. In future it would be able to explain the priority of the information functions of nature in their common complex.

Besides, the "*socio's-*" needs in the whole ecosystems is his distinctive peculiarity. The social functions of nature can be completely realised only on condition that a man would contact with the natural landscape with all their complexity and variety. It would eliminate the contradictions between the nature's functions regarding a man and necessity for environment selforganization ("ecological functions").

*Information* becomes the basic factor of the social production. The formation of the information industry is stipulated some circumstances. The first, the information becomes the productive force. The new technologies appear where the information is a mean of production, working body and the object of labour as well (computers' technologies; agriculture based on the constant renovation of the genetic material; film- and video-industry, etc). The second, the substitution of the mental work for the manual labour means at the same time the informatisation of the economy. The third, the globalisation of the social life makes the role of the communicational means more significant (e.g. Internet). The fourth, the information of economy (as it was shown at the beginning of the article) means in reality the constant increase of the production efficiency and improvement of its ecological level. The fifth, the strengthen of a "*socio-*" man's position brings to the increase of needs for information goods and services (the development of the tourism; mass interest for photo, art, sport, floriculture, etc.).

*Information elite*, probably, will become a coordinator of the social and economic life in the classless society, having swept aside from the leading position the owners of the means of production (capital).

*The productive relations*, probably, should be based on free labour with elements of the public compulsion (moral motivation predominates). Labourholic of the 1980-1990s of our century is an initial base where the free "*socio-*" can start from the economic sphere.

*The relations between a man and Nature*. Getting his autotrophy by a man gives an opportunity to speak about the possibility to eliminate the antagonistic contradiction between man and Nature. At the same time the premises for realisation of the conception of the "noospheric development" are created. This conception was introduced by Vladimir Vernadskiy.

It is necessary to mention that the remission of the antagonism in the relationship between a man and Nature can take place only in the conditions of the realisation of the statement formulated by Petr Bobrovskiy "Everything is for a human as well as a human is for everything".

*Resume*. From the ecological point of view the forming the basis of the information society can promote the solution of traditional for the previous mankind's history contradictions between a human and Nature (ecological crisis of the material-power character, antro-natural antagonism, etc). It also can contribute to the development of an personality, emancipation of a "*labour-*" man.

On the other hand, one can suppose the appearance of the new social-ecological problems, unprecedented according to complexity and character. Even now one can forecast many ecological problems connected with the over-production of the information, inability of a man to control the increasing information avalanche and the new contradictions between the subsystems in a man's trinity. In this connection it is necessary to rethink over the meaning of ecology and the ecological problems as a whole. The increasing dependence of the systems of a man's life support upon the information complexes causes the specific alarm. The woundness of a man's life becomes directly connected with the reliability and authenticity of information.

It is necessary to say that the examined topics are more contemporary, burning and close to our life as it seems at first glance. The children who are given a birth now will live in the different world. The economic system, social relations, type of business, cultural and even the language environment already in the nearest future will considerably differ from nowadays. Brining up, training and educating the young generation it is necessary to imagine the outlines of the environment where they will live. The problem of the aimed society's transformation is especially urgent for countries in transition. They will have to overcome the distance of one epoch during several years. The possibilities of the information economy of each country and its preserving intellectual potential have not been lost yet and give a chance of making choice of the right directions...

## Economic Aspects of Ecological Monitoring

*Dr. Aleksandr Teletov, Olga Alekseenko, Sumy State University, Ukraine*

Monitoring is understood as a specially organised complex system of control of conditions. Monitoring results are used for evaluation of environmental quality. The specially directed marketing research promotes the creation of a modern technological level of a constantly operational structure of collecting, processing, generalisation and evaluation of data about anthropogeneous contamination of the environment and person response to it. Environmental monitoring is used to produce the prognosis and evaluation of a situation at three territorial levels: local, regional, national.

The special significance of obtaining of environmental information has to do with the accuracy of defining a considerable number of different chemicals. Many substances in most cases are toxic, and they should therefore be identified. The used techniques should provide sufficient information on the properties of each ecological object. The multi-component structure of natural ecological systems requires a careful selection of the most effective techniques.

The information obtained is the basis for creating a data bank, without which a reasonable, scientifically grounded application of technical and biological measures directed to the preservation of normal ecological conditions is impossible.

The outcomes of preliminary marketing research have shown that a majority of sanitary and epidemic centres ecology and municipal services, industrial enterprises do not have enough techniques for the analysing rain and waste water, soil, atmospheric air and air of industrial zones, biological objects and animal products.

The special alarm is caused by food products standards. For today the domestic manufacturers have not enough financial means for highly effective production of food products. The market is filled with low-standard foreign products. But there is hope that mandatory certification will improve this situation. In future the costs of these measures will be paid for with corporate profits.

It is possible to sub-divide all the equipment for monitoring of environmental quality conditions produced by the machine-building enterprises into four groups:

- 1) super-productive equipment of first-rate quality, designed mainly for research laboratories;
- 2) rather equipment for analysis. Among them are mass-spectrometers, chromatographs, spectrophotometers etc.;

- 3) specified equipment (analysers) for the definition of substances in a specific environment (methane in mines, SO in an air and etc.);
- 4) pocket devices and devices for the express-test.

According to their functionality, the equipment used for the protection of the environment are sub-divided into 2 large classes – control and monitoring equipment. The special damage for an environment can be rendered with not enough reliable devices and control systems used in large power producing and power consumptive productions, for example, in nuclear and thermal power stations, and also in other highly hazardous production plants such as chemical processing plants and the transportation of dangerous substances. To avoid this damage, control systems are developed, the reliability of each element is improved, the special jamproof coding is entered, the systems recognition of non-standard and emergency situations is developed. The recent systems use artificial intelligence and the principles of logical information processing.

This allows the definition of a strategy for the manufacturing scientific instruments.

*First* – to concentrate attention on the development and production of rather cheap and at the same time reliable analytical devices of the third and fourth groups, as well as the equipment of the second group.

*Second* – to develop and to manufacture the equipment of the second group only with guaranteed competitiveness with foreign analogues.

*Third* – to develop the equipment of the first group only if there are new instrument-making engineering ideas, designs and technologies exceeding world standards which allows the attraction of the leading foreign contributors and instrument-making firms in joint.

Effective environmental monitoring is impossible without the use of modern systems of electronics, their accuracy of measurement and operational reliability. The solution of this problem should become one of the central task of nature treatment in visible period of time.

## Trade and the Solving Environmental Problems

*Viktor Sabadash, Youth NGO "ECO", Sumy, Ukraine*

The basic ecological functions of trade in environmental management illustrated are discussed below:

**Restrictive function:** By supervising trade flows, it is possible to influence actively and to restrict ecologically adverse goods and services.

**Regulating function:** Allows the determination of a reasonable degree of capacity in the application of the principles "polluter pays", "consumer pays", "society pays", and the establishment of rules and responsibility.

**Distributive function:** Provides an opportunity to realise the principle of equivalence for the redistribution of profit and costs, including environmental costs and benefits.

**Compensatory function:** Through trade, environmental taxes are levied and environmental costs are compensated.

**Incentive function:** By means of trade, consumer's demand for environmentally friendly goods and services is determined.

**Supporting function:** Due to trade, economic agents can support eco-balance and environmental health by using alternative energy sources, introduction of advanced technologies in cultivation of agricultural crops, and soil cultivation, etc.

**Information function:** By means of trade, consumers can obtain correct information on the available selection of goods and their uses.

In the context of environmental economic problem solving can to make classifications of trade operations. Accordingly, the trade operations can be classified as follows.

- Stages of selling objects of non-environmental purpose.
- Environmental functions of selling objects of environmental purpose.
- From world-wide scale.
- According to the processes of environmental degradation.

## Chernobyl Accident: Economic, Ecological and Health Consequences

*Dr. Inna Belova, Ukrainian Academy of Banking, Sumy, Ukraine*

*Aleksandr Romanko, Sumy State University, Ukraine*

Accident at the Chernobyl nuclear power station in the Soviet Union, the worst in the history of nuclear power generation. The accident occurred on April 25-26, 1986, when technicians at reactor Unit 4 attempted a poorly designed experiment. After accident 30 persons (staff of block and fire brigade) died receiving high doses of radiation. The square of contaminated area has been more than 130000 sq. km (by cesium in countries of former USSR only). Near 4.9 millions people lived on this territory before the accident. All population from 30-km zone was evacuated totally. A lot of people were relocated.

Impact of the Chernobyl Accident on a humanity, nature, economy and policy is tremendous. The medical problems are the most significant. Among liquidators and especially among evacuees, studies have demonstrated a discernible and alarming rise in morbidity since Chernobyl when compared to the general level among the population. This applies particularly to circulatory and digestive diseases, and to respiratory problems. Less certain is the concept referred to as "Chernobyl AIDS," the rise of which may reflect more attention to medical problems, better access to health care, or psychological fears and tension among the population living in contaminated zones.

Radioactive contamination of agricultural land, foods, water resources, vegetation are results of the Chernobyl accident. All set forth above factors, including radiation influence on health, have stipulated significant economic damage as for the suffering population, enterprises located in polluted zone, and state. The economic damage to the state consists direct losses from destroyed buildings of the nuclear power station, equipment and electricity losses up to July 1986 from four 1,000 MW reactors, towns and villages losses in exclusion zone, agricultural production losses, expenditures on decontamination, expenditures on radiological control and evacuation, costs for building "Shelter", expenditures connected to exception from economic use of agricultural lands, forests, fixed capital assets. Besides the economic damage to the state includes indirect losses: economic consequences of the increased morbidity, disability, premature mortality (additional budget expenses on public account on health services, funds payment to social insurance, underproduction of GDP), expenses of the special



Chernobyl fund on social guard of the suffering population (to make medical service free of charge, to grant some legal privileges to suffered people, etc.).

Scientists in whole world evaluate economic consequences of Chernobyl accident with different methodologies, and therefore, their evaluations considerably differed:

- scientists from Russia evaluate it more than 200 billion dollars only for economy of the former USSR countries (disregarding of losses connected to deterioration of health of irradiated people);
- USA scientists evaluate these consequences near 200-600 billion dollars for the whole world only losses from premature mortality;
- Germany scientists evaluate in 200 billion dollars the loss for all world only from premature mortality.

In case of any accident on nuclear plant, economic, ecological and health consequences of such accident can be considerably reduced if the following measures will be realized:

- training the skilled reactor operators;
- increase the safety of reactors;
- stoppage the exploitation of the most dangerous nuclear reactor types;
- provide information sources for personnel, medical staff, media, public, industry and government authorities, neighboring countries about accidents on the nuclear reactors;
- using of modern medical equipment, constructing diagnosis and rehabilitation centers;
- provide immediate large-scale evacuation in case of necessity;
- ensure strict monitoring and control radiation entering the food chain.

Some of the above-stated estimations proves, that Chernobyl catastrophe has reduced in tremendous negative economic, ecological and health consequences. In this connection more advantageously to prevent the origin of accidents on nuclear plants, than to liquidate their consequences.

## Human Rights and Environmental Protection

Ieva Balode, University of Latvia, Latvia

My research paper will be connected with investigation of the link between human rights and the environment. It was motivated by a concern to investigate a cluster of closely related questions: how are human rights and the environment related; and what are advantages and disadvantages of approaching environmental issues through the human rights framework. (This short description of my paper just is showing main problems and questions, about that I am concerned, but there is possible some changes of logical structure and in an approach.)

### *Tension between environmentalists and human rights activists.*

Environmentalists distrust the priority which human rights activists are likely to accord to the human being over other species and ecological processes. If the established human rights to life, health, property, culture, and decent living conditions are to be fulfilled for the majority of the global population rather than just a minority, and if those rights are realized in the pursuit of affluence rather than moderation, then a rapid depletion of natural resources is likely consequence by environmentalist point of view. An environmentalist suspect that there is a structural contradiction between fulfilling existing rights for a growing population and affective protection of limited environmental goods.

In contrast, some human rights activists have criticized the environmental movement for disregarding immediate human needs in the basic quest to protect biota, finite natural resources, and the basic needs of future generation.

An environmentalist argument is that degraded physical environment contribute directly to infringements of the human rights to life, health, and livelihood, acts leading to environmental degradation constitute an immediate violation of internationally recognized human rights.

### *Moral choice problem.*

Are we to protect human health and livelihood, or ecological sustainability, or the aesthetic value of existing natural endowments?

Moral choice will still lie in its interpretation. Running parallel to the question of how environmental rights may be defined, there is the question of how they may be justified in human belief systems, especially moral and legal philosophy. Moral choice problem mainly is connected with the issue of anthropocentrism of the human rights.

## NGO

Agenda 21 stated that one of the fundamental prerequisites for the achievement of sustainable development is broad public participation in decision-making.

The impact of increased NGO involvement (which has increased during and since the UNCED process) is continuing to grow. Important is to evaluate NGO's role in the international institutions as well as legal provision for NGO participation.

The influence of NGOs lies in their ability to mobilize public opinion and persuade decision-makers. If they lose touch with the public, or with the facts, they soon fail.

At the end I will try to give some description of the situation of public involvement in Latvia.

## Objectives for Sustainable Development

*Irina Fedorenko, Sumy State University, Ukraine*

We must preserve the capacity of the biosphere to evolve by managing our social and economic activities for the benefit of present and future generations.

Everyone shares the responsibility for a sustainable society. All sectors must work towards this common purpose, with each being accountable for its decisions and actions, in a spirit of partnership and open cooperation.

We must try to anticipate and prevent future problems by avoiding the negative environmental, economic, social and cultural impacts of policy, programs, decisions and development activities. Recognizing that there will always be environmental and other events which we cannot anticipate, we should also strive to increase social, economic and environmental resilience in the face of change.

We must maintain and enhance essential ecological processes, biology diversity and life support systems of our environment and natural resources.

Overall, we must reduce the energy and resource content of growth, harvest renewable resources on a sustainable basis and make wise and efficient use of our non-renewable resources.

We must first endeavor to reduce the production of waste then reuse, recycle and recover waste by-products of our industrial and domestic activities.

## Environmental Auditing in Marine Environment

*Alexey Khumarov, Odessa Polytechnic University, Ukraine*

In the time of the market reformations the problems of stable economic-ecological development in the Black sea region, where actual problems of the safeguard of marine resources and marine ecological systems are standing especially pointed, are especially actual.

For the successful solving of these problems the new instrument of the control of ecologically safe social-economical development in marine coastal zone - environmental auditing in marine environment was elaborated.

The definition of an environmental audit provided by the International Chamber of Commerce (ICC) in 1989 is: A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by: (1) facilitating management and control of environmental practices; and (2) assessing compliance with the company policies, which include meeting regulatory requirement.

The organizational bases and questions of the directing by auditing activity were worked at on the ground of the system approach. The general model of environmental auditing in marine environment was elaborated.

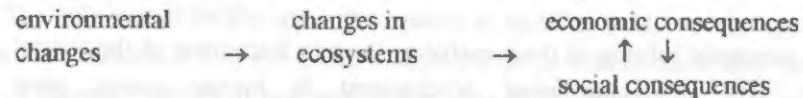
The area of action of the environmental auditing was performed with the calculation of the specific peculiarities of disposition of economic objects in marine coastal zone and spreading of pollutants in marine environment; and the area of action of the environmental auditing in marine environment and influence of marine economic object on marine environment. However, environmental auditing, as a form of control in market conditions will be effective only when it will be equipped by scientific normative ground and methodical instruments, which were elaborated as a system of ecological, economic evaluative indexes.

The practical adaptation of the methods and means of environmental auditing was put into effect on the ground of investment projects by the building, extension of capacities and reconstruction of buildings of the sea protective appointment, situated in the coastal zone of the Black Sea.

## Ecological and Social-Economic Consequences due to Environmental Impact on Black Sea

Valentyna Melnyk, Sumy State University, Ukraine

Consequences due to environmental changes in the drainage-basin of the Black Sea might develop on a chain:



### 1. Changes in ecosystems:

The main changes causes of (a) disturbance of dynamic equilibrium and above water parts of shore zone; (b) reduction of bio-productivity of the sea; (c) decrease of recreation value of the sea aquatory and coast.

### 2. Social economic consequences:

The main value of social economic damage due to environmental change in the Black Sea is realized in sectors which directly use bio-resources and properties of marine environment.

They are:

(2.1) Fishery. There exist 180 species of fish in the Black Sea and Azov Sea. During the last 50 years productivity in the Black Sea decreased by 6-8 times and in the Azov Sea more than by ten times.

(2.2) Marine economy. The Black Sea has a considerable bio-potential. There exist 350 species of Phytoplankton with average biomass 0,1 g/m<sup>3</sup> (productivity is about 40 million ton a year), 70 species of zooplankton with average biomass 0,3 g/m<sup>3</sup> (productivity is about 125 million ton a year), 205 species of sea weed (Korzhunova N., 1996) all this conditions allow to develop the aquaculture. These facts characterize the potential of development of a marine economy. It might be used for getting of a significant economic profit. Otherwise it might be lost it a tendency of the negative environmental changes would be continued.

(2.3) Recreation economy. The potential of recreation economy is evaluated as 1,4 billion UAH (700-800 USD) a year (Korzhunova N., 1996).

Coastal area of the Black Sea are especially sensitive to environmental changes. They have high bio-productivity, but very low stability under environmental load. For example, the damage caused only by reduction of bio-productivity of the sea due to only extraction of 1 million m<sup>3</sup> of coastal areas is evaluated as 2,6 million UAH (1,4-1,5 mln USD). It is equal approximately economic effect from use of this sand (Ponomarenko E, 1997).

## The Ecological Monitoring as a System of Estimation of the State of the Environment

Yuri Ulyanchenko, Kharkiv State Agrarian University, Ukraine

Ecology as a scientific base of the rational usage of nature and the protection of living beings has acquired a particular significance in the middle of the current century in connection with the strengthening of a person's influence on nature. The study of the interaction of the society and nature acquires an important significance in the conditions of the scientific and technical progress.

The rational usage, preservation and reproduction of different resources and care of nature is an important condition of the reproductive activity of all the enterprises and branches of the national economy.

The formation of the ecological monitoring as a system of estimation of the state of the environment is an urgent problem in the sphere of the information safeguarding of the ecological security of a person.

The purpose of the ecological monitoring lies in the current estimation and control of the state of different ecological systems and forecasting of the influence of technologies, melioration, pollution on the results of the economic activities, people's health, the state of the environment and the ecological and economic effectiveness of production as well.

Besides the working out of the standards and juridical acts which secure these standards is also the purpose of the ecological monitoring.

The ecological monitoring must comprise the problems of the ecological control of the state of the agrilandscapes and become the base for the acceptance of the management decisions of the ecological, economic and juridical character.

In our opinion the solution of the ecological problems is necessary to carry out in the following succession:

- find the alternative versions of the solution of these problems in the economic reconstructions;
- develop resource preserving and little waste products technologies of production;
- carry out nature protection measures such as: the creation of protected territories, building of cleaning erections, filters etc.

The formation of the ecological monitoring is a many aspect problem. It stipulates the necessity of the carrying out of the corresponding theoretical base of the building of this system.

## Estimation of Ecological Situation in Akhtyrka Region

*Vlad Markov, Sumy State Pedagogical Institute, Ukraine*

*Irine Sibirko, Julia Sibirko, Sumy state University, Ukraine*

Recently human activity makes a great influence on to the environment and system of the nature condition is witness to it.

The Akhtyrka region is the object of our research. The main problem of this region is the environmental pollution because of oil and gas mining. 50% of oil and gas of Ukraine are mined on its territory. It goes without saying that it's not favorable and even dangerous for the nature.

The first problem is the problem of disturbed lands. There are 400 bore-holes in Akhtyrka region. The average area, which is separated for one bore-hole is about 2.1 hectares. It is known that such disturbing of a plot of land produces unfavorable action on the territory, which is ten times as big as disturbed plot is. So it not difficult to count the number of disturbed lands in the region.

The next is the pollution of waters. First of all ground waters are exposed to polluting with a toxic components of the bore-hole solution and penetrating of deep fluids in accidents, and the quality of ground water get worse. Nowadays this water is a main source of drinkable water.

Also the atmosphere is polluted with the carbon oxide, nitrogen dioxide, sulfur anhydride and different carbon hydrates.

Besides the stratum of radioactive rocks in the section of some bore-holes for example in Kachanovka oil-field are watched. To make things still worse the problem of radioactive wastes utilization is not solved for today. It leads to increasing of radioactive background which negatively influences flora and fauna and which is dangerous for health of the population.

It is obvious that the damage of the changes in nature because of mining of fuel resources will be much higher than the temporal benefit. But nowadays economical and political situation in the country does not allow to make any changes.

So the environmental problems in Ukraine demands great attention and investments. And we must try, at least, to stop environmental pollution.

## The Problems of the Ecologization of Economy

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Ecologization of the economy is not absolutely a new problem. Practical realization of the ecology principles is closely connected with getting to know natural processes and achieved technical level of production. Novelty is displayed in the equivalence of exchange between nature and man on the basis of optimum organisational and technical decisions in creating, for example, artificial ecosystems using material and technical resources, proposed by nature.

In the process of ecologization of the economy specialists choose some peculiarities. For instance, in order to reduce to the minimum the damage caused to the environment, it is necessary to produce only one kind of products in a separate region. If the society needs a broadened set of products, it is advisable to develop wasteless technologies, efficient systems and methods of purification, as well as control and measuring apparatuses. These measures will allow to set going production of useful products, from by-components and waste products of the industries. It is a good practice to revise formed technological processes causing damage to the environment. The main purposes, we are aiming at during economy ecologization, are to reduce technogenes loads, to support natural potential by selfrestoration and regime of natural processes in nature, to reduce losses, to get useful components in complex, to use waste materials as a secondary resource.

Nowadays there is a connection between the quality of products and the quality of the environment: the higher the quality of products (taking into consideration ecological evaluation of waste use and results of nature preservation activity in the process of production), the higher the quality of the environment. With this in view it is necessary to adopt measures protecting the environment, account and calculation of production, ecological orientation in economical activity, ecological certification of working places and production technology.

When locating enterprises one should understand, that the differences between regions as to the sharpness of ecological situation give rise to non-equal requirements for the specialization of production.

It is advisable to differ expenditures on environmental protection connected with production and with raising the product up to a certain level of ecological quality, or its substitution by more ecological one.

The Basis of ecological state is part and parcel of the management system influencing priority in providing economy with natural resources and services within the outlined volumes of consumption.

One should realise that the damage caused to nature during production and consumption of products is the result of irrational land usage.

## The Economic Effectiveness of the Alternative Systems of Agriculture

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In developed countries the role of alternative systems of support of agriculture is limited, though for the last decade a sharp increase of their amount and extension of geography have been observed. In the structure of agricultural fields and staple foods the part of production of alternate farms makes less than 1%. It is necessary to underline, that on several kinds of agricultural production not only high standards of ecological safety, but also rather high economic figures were reached.

The cost analysis of efficiency of organic systems of agriculture is one of two the most spreaded quantitative methods of definition of their competitiveness in comparison with conventional agricultural systems.

The cost analysis of operating organic systems provides definition of industrial expenditures' structure and calculation of these expenditures concerning ground areas or unit of worked out products. There is also mandatory analysis of pricing and creation of the income in organic systems of agricultural support.

In European countries the part of alternative farms without cattle breeding is low. The alternative farms, which have no its own cattle breeding, have to buy organic fertilizers.

The specialization of alternative farms essentially differs depending on sizes of farms. The small alternative farms specialise mainly on cultivation of labour-consuming cultures like vegetable, fruits, berries, grapes and other. In alternate agriculture much more arable land is assigned under potatoes and vegetables (possibility to receive the high incomes).

The basic elements in the structure of production expenditures are the remuneration of labour and payments for the ground. In conventional farms it is the mineral fertilizers and seeds.

The production expenditures per unit of production at alternative agriculture are higher. This difference is due to lower crop capacity, higher labour inputs and expenditures on agricultural engineering and some other conditions.

There are large discrepancies in the evaluation of labour inputs' sizes in the literature on alternative agriculture. These differences are due to range of growing cultures, structure agricultural lands, level of fertility of ground, sizes of farms, availability of watering, features of marketing and so forth.

## Global Environmental Problems

*Inna Bratushka, Sumy State University, Ukraine*

Economists have long thought of the environment as an unlimited source of resources. They have thought that the atmosphere, forests, rivers and seas are capable of absorbing all the rubbish the economy throws into them. In fact, the economy and the environment are closely related. The environment supplies the economy with all its resources, such as water, timber, minerals and oil. The environment has to absorb all its waste products. Nevertheless, some economists have always argued that pollution damages the resources.

Environmental problems over the past five decades have provoked a lot of questioning with regard to the relationship between economic development and the environment.

Man has been trying to make his life easier for many centuries. In doing so, he invented machines and instruments. They have been working – and polluting the world we live in.

In this world around us, there are two things that do not belong to any one country: air and ocean water. In both the air and water, there is much pollution. People are concerned about the air and water used by everyone, and they are also concerned about the future of the Earth.

**ACID RAIN.** There are many consequences of damaging the environment. One of them is acid rain. Air pollution has led to highly acidic rainfall. Although the causes of acid rain are disputed, most scientists believe that it results from the transformation of sulfur dioxide and nitrogen oxide into sulfates and nitrates. When combined with the moisture in the air, sulfates and nitrates become acids and fall to earth as acid rain. Acid rain increases the acidity of soil, streams, and lakes, making them less habitable for plants and animals. Acid rain has become an international issue.

**GLOBAL WARMING.** During the last 100 years, the level of carbon dioxide in the atmosphere has risen dramatically, causing what some call a «Greenhouse effect». Many scientists believe that a layer of carbon dioxide and other gases traps the sun's heat, like glass in a greenhouse, thereby raising the temperature of Earth's atmosphere and perhaps leading to serious environmental problems. According to scientists temperature just a few degrees higher than normal would partially melt polar ice caps and flood coastal areas, turn productive farmland into desert.

**OZONE LAYER.** Another very important problem is destroying the ozone layer of the Earth through pollution from factories and plants. Even by using spray we are helping to create a hole in the ozone layer – the gas screen which helps to protect us

from dangerous rays of the sun. The spray is full of chemicals that eat up the ozone gas. So some greenhouse gases called chlorofluorocarbons destroy Earth's ozone layer. Ozone is distributed in a thin layer in Earth's atmosphere and shields Earth from the Sun's dangerous ultraviolet rays. Increased exposure to ultraviolet radiation weakens the human body's immune system, causes skin cancer and eye damage, and destroys crops and microorganisms.

**NUCLEAR WASTE.** Many nuclear materials are highly toxic and take thousands of years to lose radioactivity. The problem is how to safely dispose of nuclear waste. If the waste is buried in cans, the cans might someday leak radioactive material into the soil and the water table. Although experts have developed disposal technology, there are no guarantees that nuclear waste will never pollute the environment.

The territories of Ukraine are suffering many environmental problems. Many of these problems have been caused by economic activities. Apart from the effect of the Chernobyl disaster.

If we want our children to live in the same world we live in, or in a better and healthier world, we must learn to protect the water, the air and the Earth from pollution.

### **Biomass – as the Alternative Kind of Fuel**

*Elena Shkarupa, Sumy State University, Ukraine*

1. Contemporary ecological problems. The connection between shortage of natural resources (mineral raw materials and organic fuel) and energy crisis in Ukraine.
2. Global warming as a result of CO<sub>2</sub> emissions and working of the nuclear power stations. German government's decision about shutting down 19 reactors.
3. European's interest in biomass: "Green energy fuels can grow on trees". Biomass can reduce both CO<sub>2</sub> emissions and dependency on energy imports.
4. The inauguration of the first major power station in the world fired with straw and wood chips at Denmark's Enstedvourket power stations. The advantages of straw – fired plant's technology.
5. Long droughts in Ukraine – as a result of global warming. The ecological crisis in our country needs the installation of modern ecologically clean technologies. Using a biomass is a decision of Ukraine's energy problem.

### **Heavy Metals and Children's Health**

*Olga Vasyl'yeva, Dnipropetrovsk State Medical Academy, Ukraine*

Heavy metals are priority contaminants in large industrial centers of Ukraine (1). It was established that they penetrate into the environment inside industrial wastes, then circulate in trophic chains and residue in tissues of plants, animals, and humans. The health of the population is closely related to worsening environmental situation in industrially developed areas. It is established that changes in contaminated zones occur faster than humans and other organisms can adapt. Contamination penetrating into an organism and changing physiological processes lowers the resistance to microbes and considerably weakens the organisms. Previous analyses show that soil deficiencies reduce the reproduction of the population and increase the total level of sickness rate of children as well as children death rate. There were also positive correlation between concentration of Co in soils and malignant neoplastic diseases, diabetes and infant mortality, and between the concentration of Mn in soils and infant mortality (2). There was investigated pollution of some soils and snow in the Dniperside Region, and identified heavy metals (in urine, saliva, hair, and nails) by atomic absorption spectroscopy. It was established that toxic effect of heavy metals change aminoacids of the urine. Accumulation of metals in hair and nails and secretions through urine and saliva are definitely correlated. It was obviously due to enzyme features as well as the level of environmental pollution.

Pectin-vitamin tablets may be used in rehabilitation of children dwelling in the pollution regions. Pectin is a combination of natural ingredients, which have been evolutionary, admitted to the human nutritional regimen. It binds heavy metal ions accumulated in the organism due to the environmental pollution and promotes their removal from the organism. After taking the remedy, the contents of heavy metal ions in organism decreased. The contents of lead in saliva reduced to tracing amounts, and the number of children with lead registered in hair diminished. Accumulation of copper essentially reduced, concentration of zinc and magnesium was cut in half, the amount of cadmium also somewhat decreased. So, fixing heavy metals on the level of alimentary canal, pectin preparations decreased quantity of xenobiotics, which passed through organism and got fixed in tissues.

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## "Environmental Innovation" Processes: Perspectives and Main Directions

*Aleksandr Romanko, Sumy State University, Ukraine*

We are all accountable for the impact of business and its products on the environment. Day to day in each of our business and usual activities, we are faced with choices that concern the environment. These choices include the impact of businesses on air and water quality, the most efficient use of raw materials and energy, and the production and consumption of "green" goods and services.

More and more, in all over the world, businessmen are choosing to protect the environment and increase their competitiveness through the introduction of cleaner production in their companies. Cleaner production is producing goods and services so that the production of pollution and waste is avoided or reduced and resources are used efficiently. The United Nations Environment Programme defines cleaner production in the following way:

- For production processes, cleaner production includes conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes before they leave a process.
- For products, the strategy focuses on reducing impacts along the entire life cycle of the product, from raw materials extraction to ultimate disposal of the product.
- Cleaner production is achieved by applying know-how, by improving technology, and changing attitudes.

According to the above mentioned we can speak about the "environmental innovation". But, at first, I would like to pay attention on the consumers attitude to offered goods and services. We are in transition to society where the main indicator of product quality will be its *eco-performance*. In our days consumers try to buy environmentally and human friendly goods (for example, food without contaminants). Shaping ecological demand thus happens. Certainly, in such situation the manufacturers are compelled to direct their industrial activity on the similar goods. All this also promotes the extension of enterprises "environmental innovation" researches.

The main directions of "environmental innovation" are:

- "greening" of existing goods (increasing of their *eco-performance*);
- ecological goods and services development;
- clean technologies and methods installation;
- reducing the resource needs for goods manufacturing.

In many cases cleaner production systems are more efficient, and those companies which install them earliest will gain an advantage. With lower costs, they may be able to reduce their prices, or improve the *eco-performance* of their products. If the "environmental friendliness" of the product is important in the market (especially now, when green consumer behaviour becomes more widespread) they may gain an added

benefit.

Environmental policy on national and local level which stimulates technical innovation could therefore lead to a competitive advantage. There is a strong case for government support for environmental research and development. A number of countries have such programmes. Japan has developed a 100-year plan for environmental sustainability entitled New Earth 21, with present appropriations of 5 billion yen for clean technologies and 12 billion yen for energy conservation. The United States has recently initiated a new support programme for technologies with low environmental impact. The European Union Framework Programme provided approximately Euro 600 million for environmental and energy research in 1994-1998.

For my mind domestic environmental policy which speeds up innovation must become an important instrument in national government activity. That's why the "environmental innovation" have to declare as one of the economic priorities of Ukraine because we have a great perspectives in its area.

## Unemployment: Ukrainian Situation

*Evgenia Rudneva, Kharkiv State Academy of Municipal Economy, Ukraine*

"Among the purposes of a society should be to arrange for a continuous supply of work at all times and seasons"

Pope Leo XIII

Unemployment is an important problem in the world. It is easy to see why society should be concerned about the unemployed. People who lost their job suffer loss of prestige and status and their families tend to break apart. All this people decide their problems in different ways. Some people look another job, some are pushed toward crime and drugs, often they feel terrible despair. The unemployment rate tends to be higher for teenagers than for old people, for females than for males.

High levels of unemployment impose great costs on society. The economic costs of unemployment include the goods and services that could have been produced (but were not) by the unemployed.

Now in Ukraine the situation is verse than in other countries. There are a lot of factories which does not produce any product and doesn't pay wages. You can call them unemployment.

The number of officially registered unemployed amounted to 1 million people or 3.7% of the population in production age by January 1, 1999. Unemployment will continue growing in 1999 if the government of Ukraine would not change our legislation, it is mean taxation, labor law and refuse administrative regulation.

## The Use of Tax Allowances to Reduce Competitive Disadvantages Resulting from Ecological Tax Reform

*Oksana Kovalenko, Sumy State University, Ukraine*

### The various tax allowance concepts.

In the case of general cuts in tax rates, some areas of the economy receiving support would be subject to a reduced rate of tax. This reduction can be applied to the firms as a whole (the business sector), industry, particular industrial sectors (such as the basic goods industry) or individual, particularly hard-hit branches (such as smelting).

More closely oriented towards the particularly hard-hit areas of production are tax cuts whose extent is based on energy intensity. The basic principle underlying such a concept is that a certain basic energy consumption would be subject to the standard rate of energy tax, but consumption in excess of this would be taxed digressively depending on the energy intensity of individual companies or establishments.

### Impact of the tax allowances.

The impact of alternative tax allowance concepts were analysed on the basis of three variants.

Variant I: reduction of the energy tax for the entire business sector to 30% of the rate applied to non-favoured energy consumers;

Variant II: reduction of the energy tax for industry to 20% of the standard rate;

Variant III: specific reduction of the energy tax for branches of production based on their "energy tax intensity".

### Sectoral price effects.

The direct and indirect cost effects for the various sectors of economy can be determined under the assumption of constant supply and procurement relationship in the economy and the complete passing of price effects at all stages of production.

### Impact on energy consumption.

The reduction in the burden of energy tax is likely to lessen the incentive to make energy-saving investment or initiate other adjustment measures in the industries benefiting. Depending on form taken by the reduction, the support offered to firms has very different effects on sectoral energy saving. In the case of the specific reduction for energy-intensive branches the decline in revenue is only slight, whereas the general

reductions for the economy or for industry have the effect of sustainability reducing energy tax revenue.

### Vital aspect.

Ecological tax reform offers a chance of restructuring the economic system to face the challenges of the future. It offers incentives to develop environmentally friendly and low-resource-input products and production processes.

## Business Principals for Sustainable and Competitive Future

*Natalia Vakhulishina, Sumy State University, Ukraine*

Adopt sustainable development as a key operating principle of the company. Under senior management direction, and utilizing appropriate employee training and motivation, develop corporate systems and procedures to ensure the company operates according to the principles of sustainable development.

Develop corporate goals and objectives for sustainable development, and a means to measure progress against these objectives. Communicate periodically to the board, shareholders, employees, government authorities, and the public with respect to these goals and progress made.

Promote public policies and regulatory frameworks within which market forces can be fully responsive to the choices of individuals and organizations in working towards sustainable development.

Meet or exceed all applicable environmental laws, regulations and standards. Set the company's own standards when government regulations do not exist.

Before launching any new project, product or service, undertake an evaluation of its sustainability, and integrate into the planning process measures to prevent or minimize any potential environmental impact.

Adopt the principle of life-cycle management by applying sustainability criteria at every stage of the enterprise's activity – from R&D, design for recycling and re-use, and the utilization of raw materials and hazardous substances, to production processes, transportation and distribution sales and customer use, and ultimate disposal.



## Analysis of Factors Promoting the Onset of Ecodependent Pathology in Children

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Environmental situation in large industrial centers has a negative influence on the health of population, growth of the pulmonary, cardiovascular, digestive, kidneys and nervous diseases in these regions is observed. Children is the most sensitive group particularly on children's health. So, when we examine health status of children it is necessary to distinguish the ecological factor among other etiological factors. The aim of our work was to determine the level of suffer from such ecodependent diseases as pulmonary, digestive, renal and nervous systems to reveal those preventive measures which they used to protect the children from negative environmental influence and compare these facts with morbidity rate of their children. The questionnaire of 93 families, statistical grouping method and the method of statistical table's, have been established, that the majority of parents connect the diseases of their children with negative environmental situation. Most of the families (80%) wanted to leave the regions with negative environment, but they can't do it because of difficult financial situation. Annual morbidity among children of questionnaire parents increased; which is connected with breach of immune-biological protective barriers of an organism under the influence of xenobiotics. The parents did not receive enough knowledge in ecology when they studied at schools, colleges and academies. Poor knowledge of environment situation resulted in shortage of preventive measures concerning the health status of pregnant women and children. So, it is necessary to extend educational programs in ecology for people who leave in big industrial centers with negative ecological influence and programs in preventive measure as to protection of ecodependent pathology.

*Keywords:* Ecological literacy, ecodependent pathology and children.

## The Role of Heavy Metals in Onset of Ecodependent Pathology and Possible Means of Protection of Children Living in the Zones of Technogenic Pressure

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Technological development of civilization is accompanied by steady growth of environmental pollution. Children are the most sensitive group exposed to environmental pollution. Heavy metals in combination with other xenobiotics exert general toxic effect, which is together with infection leads to decrease of resistance of the organism and immune system particularly. We carried out comparative analysis of accumulation. level of heavy metals: biomonitoring of hair, nails, saliva, condense of the expired air and morbidity rate. Dnipropetrovsk in which metallurgical plants are concentrated was considered as a model of industrial center. Annual indexes of degree of pollution of air, soil, water,  $\text{NO}_2$ ,  $\text{CO}$ ,  $\text{NH}_3$ ,  $\text{HCHO}$ ,  $\text{Cu}$ ,  $\text{Mn}$ ,  $\text{Ni}$ , heavy metals, car exhausts exceed limited permissible concentrations. Investigation of heavy metals in environment was accomplished by spectrophotometer methods after preliminary mineralization of hair and nails by hydrochloric acid. Statistical grouping method, the method of statistical tables was used in processing of results. Comparative analysis demonstrate, that the enlargement of lymphadens is observed when  $\text{Cu}$ ,  $\text{Zn}$ ,  $\text{Pb}$ ,  $\text{Cd}$  concentration rises in organism;  $\text{Zn}$ ,  $\text{Fe}$  influences the activity of thyroid gland adenopathy; the quantity of children frequently ill with respiratory syndrome rises when  $\text{Pb}$  contain increases; the rise of  $\text{Mn}$  changes condition of hypothalamic- hypophysis-suprarenal system, causes vegetative displacements and desadaptation syndrome. So, it is necessary to use remedies decreasing the entering of heavy metals into child's organism and intensifying their disappearing (pectines, sprout grain of wheat, other absorbents, polyvitamines, adaptogens) in prophylactic of ecodependent diseases and in treatment of ecodependent pathology.

*Keywords:* Heavy metals, ecodependent pathology and children.

## The Financial Analysis and Management: Environmentally Oriented Aspect

*Victoria Svetlichnaya, Sergiy Dvorkin,  
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The concepts «ecology» and «economics» have a semantic unity, that is a similar root «ecos» («home» – in Greek). Namely, these scientific subjects research human life from the point of view of his great house – the Earth; to consider them separately or to oppose them – it isn't correct.

A firm can be considered by us as the economic-environmental system. The firm activity strategy is oriented on the environmental protection promotes the economical growth of the society as a whole. At the same time the more significant the economical growth and the prosperity level at the society are, the more possibilities to realize environmental programs there exist.

The purpose of the policy directed against environmental pollution is to make a polluter to pay all the expenses connected with his activity (Polluter Pays Principle).

This rule explained morally and economically is a key issue of the environmental policy in the most of countries.

The same policy is needed to stick to it stimulating a firm's activity of investments into the environmental protection.

We would like to propose the following ways of the economical decision of the pollution problem:

- The state amortization policy which stimulates the environmental protection is used in many developed countries. One of the forms of such a policy is such named super-intensive amortization regime for «anti-pollution» equipment
- It's necessary to change the basic accounting forms in Ukraine (especially forms No. 1 and 2) in such a way that we could take into account expenditure with the purpose to protect environment
- A very well known definition that profit is difference between revenue and expenses isn't exact at present.

Profit should become an index of the social orientation of the firm activity (including the ecological status).

Existing financial analysis methods do not reflect the «environmental» activity of the firm. We suppose profit to be corrected by the value of the ecological damage caused by the firm activity:

$$\text{Profit} = (\text{Revenue} - \text{Expenses}) - \text{Damage.}$$

This method isn't equal a simple taxation or fining the firm. Besides this is an instrument of the financial analysis and management in their ecologically oriented interpretation.

It is necessary to compare additional investments with the purpose of negative consequences decreasing and these negative consequences decreasing in these initial meaning.

That's why we can calculate return on the environmental measures.

So, the state has a lot of financial mechanisms which may help to make all the environmental measures more effective. We suppose the change of the current approach to profit to be one of the main ways to use these mechanisms.

## Solar Energy: Experience of Sweden

*Denis Igitov, Sumy State University, Ukraine*

In this paper I want to tell about the project of using solar energy in Sweden. The first solar collectors appeared in this country at the beginning of 1980's, but it was not widely spread and just for last few years using of it increased after successful project results of establishing the solar collectors on the central heating plant at Lunden city, Onsala. The solar collectors were established on the roof of this plant, occupied about 220 square meters and provided more than a quarter of the area's total energy needs. It became possible with the help of construction industry organizations which found a new technology of the roofs with the solar collectors. The organizations of this project believe that it would become the real break through to the new source of energy. The solar collectors are made with the very stable elements and the weight of each square meter is about 40 kg. During many years the measurements of solar radiation, temperature and others were taking here and showed that everything were normal for a wide using. So now these batteries are hoped to be spread on the roofs of each building. Nowadays more than 6,000 square meters of the solar collectors are established, but the plan is to provide the roofs with about 10 million square meters during the next 15 years. And there is an example already in Germany, where the law stimulates people to use solar energy for heating the water in their houses. And it, of course, must be an example for each country.

## Linking the Environment and Tourism Development: a Challenge for Establishing Standards for Research

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The global tourism industry has achieved a status of #1 – even a decade ago – which should have been envisioned.

Tourism industry is directly based on intrinsic qualities of the environment. However, these qualities are no longer limited to the sun, sea, sand and snow.

Tourism is attracting more and more attention, informational needs are constantly growing. Understanding tourism, its impacts on the environment and management systems will become a major focus of research over the next decade.

The process of conducting research on tourism-environment questions is no different than dealing with other significant questions of human interest.

In discussing standards of tourism-environment research, one must first define the role of knowledge in assessing tourism-environment questions.

1. The goal of research on tourism-environment linkages is to reduce uncertainty about decisions on tourism development through an increase in our knowledge base.
2. Knowledge is dispersed throughout many disciplines, not limited to the scientific community, and is provisional in nature.
3. The public's values change and thus the relative importance of various consequences shift over time.
4. Science is limited as a basis for action to address consequences; its role is to map and measure consequences, engineer resolutions to problems and to suggest potential avenues to the future.
5. Development of standards (as recommended scientific protocols) requires not only general agreement about the definition of the questions, but agreement about the cause-effect relationships.

There are four major defining questions that would seem appropriate to increasing our understanding of tourism-environment linkages, and for which research protocols need establishment.

1. How do people value and use natural environments for recreation and tourism?
2. How can tourism be used to enhance the livability of communities?
3. What are the social and environmental impacts of tourism?
4. What are effective management and planning systems for dealing with the consequences of tourism?

Principles guiding research on the environmental effects of tourism:

1. The consequences of tourism may be temporally and spatially discontinuous between the activity and where and when they occur.
2. Consequences can only be understood through a characterization of the context of the situation.
3. Consequences of tourism development must be described in terms of their meanings for people.
4. Behavioral and development patterns are more important in understanding impacts than tourist numbers.
5. Consequences appearing at one scale may not occur to another.

The attempt to find standards, as generally accepted research protocols, may work well in settings where the problem is well-defined, the goals are agreed upon and cause-effect relationships are understood and documented.

## Fuzzy Logic in Ecological Systems

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This paper attempts to build a common sense of understanding of the subject to form a better basis for practical application of the fuzzy logic, particularly in ecological systems. The fuzzy inference process splits into three parts called fuzzification, rule evaluation, and defuzzification. Fuzzification is the process of decomposing a system input and/or output into one or more fuzzy sets. The rule evaluation step processes a list of rules from the knowledge base using current fuzzy input information from the previous fuzzification step to produce fuzzy outputs in memory. Defuzzification uses the fuzzy outputs to produce a single output value for each system output.

All components of one single ecological system can depend on each other or/and influence each other. The main goal of ecological system control is to keep that system balanced in spite of many ruling factors such as: population growth or its degeneration, pollution, diseases, etc.

Fuzzy logic can control ecological systems dynamically. That will help in the observation of systems themselves and to facilitate the adjustment of their component values even as those systems function.

Graphs could be used for complex mathematical models developing, and for results analysis taken from the minimum of information. Such graphs can represent the different connections with a number for variables relative to industrial waste removal.

The fuzzy logic usage combined with graphs could be found in many system control areas such as ecology. It will require only a different knowledge base for each application.

## Environmental Management and Sustainable Development

*Angelika V'one, Sumy State University, Ukraine*

Sustainable development does not oppose economic growth where justified, as it does not want to ensure the quality of the environment by way of the conserving poverty.

According to the definition of the Bruntland Report, "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The strategic imperatives for sustainable development are as follows:

- reviving growth;
- changing the quality of growth;
- meeting essential human needs;
- ensuring a sustainable level of population;
- conserving and enhancing the resource base;
- re-orienting technology and managing risks;
- merging environment and economics in decision making;
- conclusions of the strategic imperatives for sustainable development.

International economic relations raise specific problems for poor countries who are trying to manage their environments as the export of the natural resources plays a significant role in their economies. The uncertainties of the world market and the adverse price trends they have to face make it impossible for them to properly manage their natural resources. The growing burden of debt service and declining inflow of new capital into these countries reinforce those trends which lead to environmental deterioration and resource depletion and discourage long-term development.

A good example of the impact of trade on the environment is the export of tropical timber.

At present, international reforms are needed which treat the economic and the ecological aspects at the same time and which allow the world economy to encourage progress in poorer countries, while simultaneously emphasizing environmental considerations.

## Economy and Ecology

*Sergey Pereroslov, Crimea Tourism University, Simferopol, Ukraine*

Management of the process of nature protecting steps by solving ecological problems is one of the most important tasks for our modern society.

How can we organize this process?

Environment is the complex, which is presented by natural environment and environment changed through a human activity. That is why the approach to problems of the environment has to be composite in any way.

And it is necessary to point out:

1. Indispensable requirement to anthropological activity is *not* to make harm to the nature. Ecologically literate professionals must handle this challenge using a composite approach.
2. It is necessary to design economic activity in the way of optimizing the quality of environment and to improve the process of using the nature. This is one of the most important conditions of economic development, which has to promote not the gap between humans and nature but approach.
3. Crimean economy has already directed to development of resort, recreation and tourism systems. Development of these directions is closely connected with environmental problem. Through improving them and making better environment we promote economic development and better life rate and living conditions of local population. And the exact reflection of that view is setting up the program 'Blue Flag of Europe'.
4. It is very important to use all measures, including economic, environmental, social, juridical and others for stabilization of ecological situation. First of all we must use economic tools of nature protection. We must help nature regenerate its resources and to clean oneself up.
5. Before handling any engineering challenge we must accept for the main the calculations of possible damage for natural environment and possible economic effect of natural spendings. And in obligatory order managers must know how to do it. I mean also it is the question of education too.

Only after solving these problems Environmental Management can really take place.

## Wastewater Treatment Problems in Lithuania and Ecological-Economical Benefit of These Problems' Solution

Anastasija Koldajeva, Klaipeda University, Lithuania  
Marius Mazeikis, Klaipeda University, Lithuania

Water is the main source of life. We are living in a world 70% made of water. So why don't we care about how do we use this gift of nature and why does the pure water becoming a problem in a modern life? Is it only the ecological question? We guess not. If we look carefully at it question, we will see that it is possible to have also some economical profit solving these problems. It is obvious that water as ecological parameter has a vast influence on many aspects of human's life (including the economical one).

Talking about Lithuania it must be mentioned that it is not a big country but it has enough water resources to take them into consideration. Besides, by the geographical viewpoint the state belongs to the Baltic Sea drainage basin, so it must not be forgotten too.

Lithuania, as any other country in the modern world, has some water problems, which are desirable to be solved in the nearest future. Some of them are:

- Increasing of industrial and domestic pollutants.
- Not sufficient water treatment systems.
- Not using water-recycling technologies.
- Misunderstanding the significance of these problems.

To show that all these problems are economically urgent in the life of the state it is necessary to remind that:

1. Increasing of pollutants means the decreasing of drinking water quality, and as the result of it – the aggravation of people's health → *great expenditures for health services.*
2. The bad water quality has a great influence to the water ecosystems' and aquacultures' concern → *bio resources are getting worse, fish industry is weakening.*
3. Bad polluted recreation areas cause the diminishing of tourists' flow to these regions → *great material losses in the tourist business.*
4. Not using the modern water-recycling technologies → *the impossibility to use all the economical advantages of the recycling industry.*

These are only some examples of such kind, but this theme is much vaster and has a lot of aspects to talk and think about.

## Ukrainian Net of Gaschannels

Eugeniy Terekhov, Ukrainian Academy of Banking, Sumy, Ukraine

The transport gasification is one of the approaches of ecological-economic problems solution in Ukraine. These approaches are connected with the lack of own energy-bearing in the country, accepting motor fuels, as well as connected with environment improvement, because transport is one of the main disasters.

Along with the advantage of the working the inside burning engines on the gaseous fuel there are definite problems of its spreading in the transport.

1. *The infrastructure problem.* There fore, the problem is in the development of gaschannel net, rather than in the gas delivery to the place of it consuming. This net should allow to put in the cars fuel of required standards and good quality. At the same time the task of inputting the filling stations in the city should be solved. this task is complex enough in the organizational and technical senses.

2. *The gas-fuel capacities problem.* One of the most important problems concerned with the spreading the use of gaseous motor fuel in transport is the improvement of gas-fuel capacities for gaseous fuel preservation.

The necessity of application of the high pressure bottles for natural gas is the substational drawback of pressed gas. This bottles have big mass and sizes. Because of it the mass of gasbottle cars with carburetor engine grows up, and loading and movement reserve reduce comparing with the analogous indicators of cars with work on the benzine. Because of the big bottle mass, they are installed in preservation. This reserve supports the benzine. The gas-fuel equipment installation leads to the increasing of full speed time of the transport, as well as movement speed reducing at the lifting and worsening of it dynamic.

3. *The problem of reliability of the gas bottle system of the engine feeding.* Also there is a problem of reliability of the engine feed system. The car exploitation practice (for cars which work on pressed natural gas) has shown a number of drawbacks of the gasbottle feed system, which lead to the disturbance of its hermetition.

4. *The problem of the engine capacity increasing.*

Now the car re-equipping to using pressed natural gas as a motor fuel is done by gas-fuel equipment installation in the existing engine without it construction changing. But he advantages of gaseous fuel are not fully used. It means its work with increasing degree of pressure, to 12-14 units (at the existing cars – to 10 units).Because of it the engine looses the 10-20% of its capacity.

## Seaport's Influence on the Environment of Klaipeda City

*Raimonda Kaupyte, Klaipeda University, Lithuania*

Klaipeda is the single and the principal seaport of Lithuania. However it is the main Lithuanian gate to the world. Lithuanian, as the sea republic's, development depends on Klaipeda City, seaport's progress and seaport's opportunity utilization. As Lithuania obtains the role of a transit country, the volume and structure of freight visiting its port rapidly changes. Good geographical situation of the city makes favourable conditions and opportunities for developing port's work, which would satisfy the requirements of market and increasing economics of the republic. As a result, Klaipeda port was intensively reconstructed and expanded during the last decade: at present the dredging works are carried out in a fair way, the entrance channel seeking the project depth of 14m, cardinal reconstruction of port gates, etc. are being worked out.

There are two closely connected aspects, in relation to seaport's development:

### 1. Economical:

Talking about economical position, we can appreciate seaport developing positively because it is profitable for Lithuanian budget. At the present time port yields a greater profit currency income.

### 2. Ecological:

Besides the economical viewpoint, we must take into consideration ecological situation. The port influences:

- a) air pollution in Klaipeda surroundings;
- b) coastal zone geosystem (including the marine coasts) in the adjacent areas;
- c) water pollution in the Baltic Sea and the nearest surroundings;
- d) various fish distribution because of the water pollution;
- e) various unique coastal plants distribution and etc.

Any steps for developing seaport must be weigh the pros and cons, how it would influence the nearest ecosystems. We must find economical-ecological sustainable decisions.

## The Stimulation of Environmental Protection Activity

*Ekaterina Galushkina, Victorija Polischuk, Odessa Hydrometeorologic Institute,  
Odessa Construction Academy, Ukraine*

Questions of steady ecological development are urgent for the Ukraine, which at present suffers deep ecologo-economic crisis. This is resulted from the long time dominated principles – to obtain the maximum profit with minimum expenses. As an effect, at present anthropology pressure on the nature approaches to the limiting level of its economic stability. Thus the modern stage of interaction of society and natures should be based on the other principle – the obtaining of as high as possible economic effect with obligatory conservation of dynamic balance an geo systems.

Therefore the important problem of the state economic policy of Ukraine becomes the restructuring of economy towards ecological approaches and development of the research on the basis of new scientific knowledge.

And the stimulation of Environmental protection activity must be the core of ecological politics of Ukraine.

In view of ecologo-economic crisis and inefficiency of existing methods of ecological management in the Ukraine, it is necessary at most short terms to enter a system of economic regulators the use of nature, leaning on the advantage of «late developments», possibility to take a world ecological experience into account.

As to measures of reforming of economic mechanism of ecological management in the Ukraine, it is reasonable firstly to raise effectiveness of existing ecologo-economic instruments, somehow: payments for contamination, ecological tax, ecological funds, fines; and secondly, enter new, more efficient regulators of the utilization of environment. This regulators could be stimulating enterprise activity in the sphere of ecology (favorable taxation, lending, speed amortization, subsidies), as well as compelling enterprises to keep a check on ecological condition of economic activity (charge per surges of polluting materials in the surround ambience, for using the natural resources, for using the ecological harmful technologies).

It is clear, that for the realization of positive changes to the economic mechanism of ecological management in the Ukraine it is important to solve a broad circle of different problems – operational, financial, legal, social, political. And what is most important it must be the Governmental ecological protectionism of the restructuring of economy towards its ecologization.

## Governmental Support of New Ecological Production Manufacturers

*Olga Prokopenko, Sumy State University, Ukraine*

In modern ecological-economic conditions a production ecological innovations is necessary that's why legislative ensuring of conditions for their development is important. Excessively high expenses of first times of can't be replaced on buyers, because this would overlay the road to the market. The producers of the principally new ecological production are monopolists inevitably, but they must be supported.

The Main methods of the production of ecological innovations support can be: direct budgetary financing of the development, the production and spreading of the ecological innovations; the waiver from the import duty rates of the property of scientific organizations imported which is necessary for the development of ecological production; the target programs, government's orders on undertaking of the corresponding SREDW; the creation of ecological funds, which use significant tax privileges; the creation of specialized state exploratory institutes, laboratories, centers; the right of the speeded amortization of the equipment, used for undertaking of the ecological developments and releasing ecological production; the privileges of the payment of state services – communication, electricity, heat, and others; forming of the information infrastructure in the field of ecological developments; increasing of the public status of the innovational activity in ecological direction; the favorable taxation of profit, got from the realization of ecological production; granting of the privileges during importing currency in the country for producers of ecological production; the waiver from the payment of tax on property and land, referring to the producers of ecological production; partial or full waiver from trade duties; the reduction of state patent duties for the individual businessmen-developers of ecological innovations; granting of the free bank advance-money to individual inventors and small commissioning enterprises; the delay of the payment of patent duties on resource saving and other ecological inventions; rendering of the legal, business and other services, help in searching for partners, conclusion of deals under state warranties; partial or full insurance of innovational risks for developers and producers of ecological innovations; state initiating of so-called demonstration projects.

The expenses of ecological product producers support will be justified. Ukraine could solve many economic problems, on account of production and sale of ecological goods and services brighten the production, stop the growing unemployment.

## Wells as Indicator of Environmental Health

*Michael Oxen, Maxim Reva, Dnipropetrovsk State Agrarian University, Ukraine*

A well is a direct conduit from the day surface to groundwater - literally, a hole drilled into the productive aquifer. The method of well construction, the frequency of well inspection and maintenance and the proximity of a well to pollutant source are important factors determining the potential for pollution.

The main sources of groundwater contamination in Prydneprovsky region are brown coal, uranium, manganese, iron and polymetal ores mining.

Frequently the mining groundwater are salinized. In this connection water salinization of the small rivers situated near mining regions become fact too.

The permanent monitoring is necessary so that prevent the cases of the soil salinization in future.

## Making Decision for Water Management

*Maxim Reva, Michael Oxen, Dnipropetrovsk State Agrarian University, Ukraine*

Groundwater is a water that lies below the soil surface and fills the pore spaces in and around rock, sand gravel, and other geologic substrates. The depth of the water table below the soil surface fluctuated throughout the year, depending on the amount of water removed from the ground and the amount of water added by recharge and connected surface waters.

Today, many chemicals, including nitrates, pesticides, have been detected in groundwater in Ukraine. That is why it is considerable to choose best irrigation systems. Various methods of irrigation are applying now. They include overhead sprinkler irrigation, burrow irrigation, subirrigation and drip irrigation.

A major disadvantages of sprinkler irrigation is high energy use, because of the pressure required to distribute water through the system. The advantage of drip irrigation are very high water-use efficiency and low total use of water, excellent uniformity of distribution and the ability to irrigate fields with any degree of slope. Drip systems allow accuracy in both the volume and the frequency of application of water. They are also very accurate and efficient in applying fertilizers and pesticides.

## Environmental Management Systems and Cleaner Production

*Nadeghda Ivashova, Sumy State University, Ukraine*

The management of an organization – whether private or public, large or small, wherever it is located in the world, whatever the culture and state of development of its host countries, whatever its products or services – needs to be efficient and effective if it is to survive and prosper.

Environmental management systems and cleaner production are important subjects and worthy of the detailed discussion. The two fields have emerged against a backdrop of increasingly stringent environmental legislation, growing public awareness, globalization of trade and harmonization of standards, leading businesses to identify ways to mitigate and manage the environmental impacts associated with their production activities.

Environmental management systems have been developed more recently and consist of the organizational structure, responsibilities, practices, procedures, processes and resources which the enterprise uses to achieve its environmental policy. The first environmental management systems standard (BS 7750) appeared in 1992 in the UK, subsequently many other countries have developed standards and the International Organization for Standardization (ISO) has also developed an environmental management systems standard, ISO 14001.

Standards as an instrument of business strategy must provide the sort of flexible guidance that enables innovation through the systematic development and achievement of continually improved policies, objectives and targets. This may sound like a given but it is not an easy goal to achieve.

Today, the ISO 9000 standards are becoming the standards by which business does business. In a few years, the ISO 14000 standards will play a complementary and supporting role.

Environmental management standards are systematic. They help a company establish where it is in the present, where it plans to go in the future and how it must meet its own individual targets to get there.

## Economic Mechanism of Water Use Management in Ukraine

*Vladimir Melnik, Sumy State University, Ukraine*

Economic mechanism of water use management in Ukraine includes two principal parts:

1. Economic instruments of a control of water consumption
2. Economic instruments of a control of water pollution.

The first one includes three types of instruments:

**1.1. Controlling the water consumption through water supply systems;** it consists of:

- charges,
- coefficients government subsidies and
- limits, Which control the quantitative use of water/

The rates of change depend are based upon the cost of preparing water for the supply system which are different in various areas and various river basin of the country. For example: in the basin of the *Dnieper* the maximum average rate is in Chernihiv region – 0,7 UAH/ m<sup>3</sup> of used water and minimum is in Kirovograd region – 0,2 UAH / m<sup>3</sup>.

The rates are set up different for various kinds of consumers. The average coefficients are:

- people - 1,
- municipal economy - 2,1;
- enterprises of food industry - 4,5;
- the rest government enterprise - 2,4;
- the rest private enterprise - 3.

There exist as well as the system of limits. The rates in the case of exceeding the limit are 3-5 times more than regularly.

**1.2. Controlling water use by hydroelectric power stations.** The rates of charge are set up with coefficients 0.005 of basic average rate in given region.

**1.3. Controlling water use by river transport.** The rates are:

- a) freighters – 0,02 UAH per 1 t-day of transport work;
- b) passenger ship – 0,0015 UAH per 1 passenger place-day of transport work.



The system fees for water pollution consists of two parts:

**2.1. the fees for enterprises**

**2.2. the fees for ships.** The fee rates for water discharge done by enterprises depend on harmful substances. For example, the are (UAH):

- BOD - 14,
- petroleum products - 206,
- heavy metals - 1 995

**2.3. the ship rates are (USD/kg):**

- petroleum product - 329;
- heavy metals - 12 936;
- pesticides - 430.

### **Sustainable Development Towards the Year 2000: Successes, Deficits and Goals**

*Olga Melnik, Sumy State University, Ukraine*

In this report author tells about sustainable development's successes and deficits in the social, economic, environment and political dimensions.

The main idea of the report is that sustainable development includes more than endowments of natural capital. And now human capital gains more importance than ever before. This is the report about new time and its characteristics.

It is time to change our idea of environmental space and realize that sustainable development begins at home.

It is time to use new value systems and modern models going towards a sustainable modernization ideal.

It is time to understand that environment-friendly filling, thinking and doing (housing) is pursuing our self interests.

And only by changing our type of thinking we can stop global ecological crises and look at the 20<sup>th</sup> century with a pain in our hearts but into 21<sup>st</sup> century – with clear plans and hopes for better behavior of Earth's children.

### **How EC Protects Its Environment**

*Natalia Zhoglo, Olena Didenko, Ukrainian Academy of Banking, Sumy, Ukraine*

Our subsequent work is connected with the research in current ecological thought in the EC. According to the recent work in this field the EC has accepted the principle of sustainable development and has adopted a programme which recognizes the cost of the environment as an economic resource in several ways. We are sure the EC experience will be useful for Ukrainian policy in this way.

At the beginning of our analysis let us give a cursory description of environmental threats in the EC.

*Air.* Some progress has been made in reducing emissions of sulphur dioxide, suspended particles, lead and CFCs at Community level but serious problems are increasing with regard to carbon dioxide, oxides of nitrogen, atmospheric ozone and methane.

*Water.* Over the last 20 years, the state of the Community's water resources has not improved. Since 1970 there has been a 35% increase in the withdrawal rate throughout the Community.

*Soil.* Up to the end of the century, both physical and chemical degradation of soil will continue, not only through the input of chemicals but also from diffuse sources of air pollution.

*Waste.* The Community currently produces in excess of 100 million tonnes of municipal waste every year. In developing regions there is the added problem of the sharp increase in industrial waste.

The Community has adopted more than 200 directives over the past 20 years aimed at improving this situation. To justify this we'd like to look through some facts. The most innovative aspect of the EC programme is its proposed carbon/ energy tax aimed at reducing CO output and increasing energy efficiency. The carbon/energy tax would not be additional to other taxes. The next point is that manufacturing firms are investing in clean state-of-the-art technology. The Community also recognizes the special need of financial support for its poorest members. The Cohesion Fund set up under the Maastricht Treaty will provide them in cash for environmental projects. The EC has agreed to phase out CFCs. Exhaust emissions from automobiles are controlled and all new cars must be fitted with catalytic converters.

It is worth pointing out that the Member of the EC's Commission Yannis Paleokrassas focuses on integrating the environment into the heartland of their economic policy. He thinks it is as important as any other of the Community's policy commitments. Most of the countries try to follow the EC programme.

### **The Influence of Ecological Factors on Further Development of Manufacturing**

*Nikolay Kharchenko, Sumy State University, Ukraine*

My research paper deals with manufacturing development, its structural re-organization aimed at minimizing its damage to the environment.

Manufacturing development in the Soviet Union was mainly directed at attaining economic indicators. But the economic indicators characterize the activities of the enterprise only from one point of view because they don't take into account the expenses for restoring the environment it being influenced by human activity.

Very often the government tries to raise the economic development level of the state at the expense of the leading branches of industry which bring maximum income to the budget of the state. It is a fact of history, that the leading branches of Ukrainian industry are ecologically dangerous. Take for example metallurgical, chemical and petrochemical, machine-building and power-manufacturing industries. That is why further development of these branches using outdated technology may prove to be destructive both for environment and for society. The scale of production of the leading branches may be increased due financing technological improvements and creation of purifying installations.

Another way to take is to develop branches not dangerous for ecology, such as tourism and recreation.

We may come to the following conclusion: while developing economy in the near future we have to take into account both economic indicators and consequences for the environment.

### **Ecological Audit – Path to Cooperation for Environmental Protection**

*Dmitriy Plyatsuk, Sumy State University, Ukraine*

The present system of imposing penalties from companies for a pollution of the environment is far backward of time and the development of the market relations.

The activity of nature protecting institutions, which execute the environmental condition control, embraces only the ascertainment of fact of pollution and the decision on particular originators. The application of the penal actions leads to a paradoxical situation: the sizes of the penalties do not correspond to a level of injury. However, at elimination of the disparity, all the companies might appear the bankrupts, especially the state companies. The ecological audit is a path to cooperation of nature protecting institutions with companies, businessmen and scientists deals with the environmental protection. It is also an effective mean influence for nature protecting institutions on originators of an environmental pollution, that gives opportunity to common actions in the sphere of search and selection of a system, ensuring full conformity of an environmental quality and production, the substantial alternative to a present system.

The system of ecological audit will be already used in developed countries of the world. The different commissions conduct the development of the documents on ecological audit of companies, of their manufacturing technology and of whole industrial regions. The main purpose of audit in Europe is a minimization of scraps, optimal usage of natural resources, reducing and improvement of power consumption, preventing technogeneous catastrophes, emergency industrial discharge.

The practice of ecological audit, as the integral part of nature protecting activity in conditions of market economy of Ukraine, makes only the first steps and is in a condition of searching. The development of scientific and practically justified instructions for the particular companies, branches of industry, as well as for the whole industrial regions, will allow to improve the companies efficiency as for rational usage of natural resources and the environmental protection, the safety of personal labor, health of the population. The ecological audit is especially important at active foreign investments for creation of joint ventures or companies with the foreign capital that requires the appropriate to world practice mode of ecological activity in view of Ukraine special features, definition of paths for the development of the appropriate normative base.

## Global Warming: Ray of Light

*Anton Solopihin, Nikolay Grintsov, Ukrainian Academy of Banking, Sumy, Ukraine*

The problems of scientific-technical progress made the society look at most world problems and ecological in particular in a different way. Convulsions of nature showed us that we have to pay more attention to the environment conditions. The most discussed ecological problem of today is the global warming. The cause of this question lies in the emissions of six greenhouse gases – mostly pollutants caused by burning coal, oil and other hydrocarbon fuel. This issue was discussed at the UN global warming conference in 1997.

At this conference delegates got the opportunity to get a full picture of today's situation. They were shown different examples of global warming. El Niño, the product of greenhouse effect, that caused a lot of trouble in both Americas, Africa, South Asia, clearly depicted, the importance of this issue.

The protocol, adopted by the 159 countries present, sets legally binding targets for cutting the emissions of six greenhouse gases by an aggregate 5.2% from 1990 levels during the years 2008 to 2012. But it didn't solve the problem. Without America's involvement, the new UN protocol is hardly worth the paper it is written on.

The Americans, who now belch a quarter of worldwide greenhouse gas emissions: (twice as much per person as any European country), have been trying to lay down the rules for reducing them. At first, they insisted that all they could achieve by 2012 would be to cut their pollution output to the same level as in 1990. Even then, they would need to be free to trade pollution "credits" with other countries. Also the Americans demand that the developing countries – especially China and India – should be active participants of this agreement. But this agreement has the paragraph calling for the voluntary participation of developing countries in greenhouse gas reductions. Many of America's other demands remain intact, too.

In the final carve-up, the protocol divided the industrialized countries into eight groups with different targets for reducing their greenhouse gases. The European Union heads the group that is required to make an 8% cut; America has to reduce its emissions by 7%; Japan by 6%.

As we can see, world community started to comprehend the ecological problem. The UN global warming conference was only the first step. In order to preserve our living in healthy conditions, we mustn't stop on the achieved, but to move on in this direction.

## The Ecological-Economic Substantiation of the Innovation Projects

*Victoria Bozhkova, Sumy State University, Ukraine*

Economic growth of the country and the increase of competitiveness of its economy are closely connected with the innovation activity, the intensity of which aggravates ecological problems of the society. The latest technologies based on the last scientific and technological achievements give the opportunity to reduce harmful emissions, to limit the use of hardly renewable resources in production processes. The adequate legislative system, regulation tools and executive mechanisms of innovation activity play the principal role in this problem.

One of key problems in the ecological and economic substantiation of the innovation projects is the necessity of further increase of the scientific validity of accepted decisions. The complex evaluation of the ecological and economic level of the innovation enterprise has to include the main (resulting) branches of production processes, economic and ecological activity of the enterprise, it has to include the limited number of generalizing ecological and economic parameters, which could be easily observed by the subjects of the evaluation; it also has to be elastic (to catch the dynamics of changes of the public necessary expenses in the sphere of protection and use of the environment indirectly); its components should not duplicate one another; the comparability of parameters in time and space with the similar parameters on a considered number of the industrial enterprises should be supplied as well.

Consequences originating from the unreasoned approaches to the ecological and economic substantiation of the innovation projects are difficult to overestimate. Proceeding from above-stated, it is necessary: to take into account the factors of the environmental development on the political level, planning and management in the sphere of innovations; to supply the innovation activity with effective legislative basis and organizational structure; to develop effective economic toolkit of the ecological and economic substantiation of the innovation projects; to generate a system which combines the ecological and economic account.

The results of the objective research of the complex influence of the innovated enterprise upon the environment will give the opportunity to avoid a further deepening of the ecological and economic crisis. Countries performing the most severe requests to introduction of the innovation projects and the high ecological standards, according to the international experience, are leading in competitive struggle and have strong position.

## Corporate Environmental Indicators

*Olga Lukash, Sumy State University, Ukraine*

Environmental controlling has become increasingly important in the past years as an instrument for successful management and securing the existence of a company in the long-run. Environmental controlling consists of planning, controlling and monitoring a company in consideration of environmental factors. Indicators are the most important management tool of environmental controlling. They are used to provide the decision-makers with important information.

There are three groups of environmental indicators: Environmental Performance Indicators, Environmental Management Indicators, Environmental Condition Indicators.

Environmental Performance Indicators can be used by any company as a starting point. These Indicators concentrate on planning, controlling and monitoring the company's environmental impact.

Environmental Management Indicators present the organizational actions of management to minimize company's environmental impact.

Environmental Condition Indicators describe the quality of the environment surrounding the company. These data are used to make environmental indicator systems for the main environmental problems.

Environmental indicators have many advantages. They summarize extensive environmental data to a limited number of significant and comparable key information. These indicators determine profitable environmental opportunities.

Established environmental indicator systems support corporate planning, controlling and monitoring of environmental impacts in environmental controlling and provide information for the management. Environmental indicators therefore help to:

- identify weak points and optimization potentials;
- determine environmental objectives; and
- document continuous improvement.

## Distinctive Traits of Conducting of Procedures of Environmental Impact Assessment in Japan as Compared with Ukraine

*Kateryna Borysenko, Kharkiv State Academy of Municipal Economy, Ukraine*

The Environmental Impact Assessment (EIA) is one of the main function of governmental environmental policy and nature management. To EIA should be subjected very projects of economic and other activities that can render to harmful influence on the environment. The EIA conducts in several stages. Results of EIA are included in the final conclusion. The final conclusion may recommend to adopt, to reject or to return the project for further correction. There some main rules of conducting the EIA in Japan and Ukraine.

The aims and main principles of the EIA are the same in the both countries, but procedures of its conducting significantly differ.

So, considering these procedures of the EIA in Japan as one of the most industrially developed countries of the world one can separate the following distinctions:

- including in the number of projects subjected to EIA those with lesser scale than at any other country in the world;
- attraction of NGOs and broad public to many elements of EIA procedure.

Environmental centres, which carry out EIA in Japan, finally prepare two main documents:

1. detailed expert assessment of possible influence of the proposed object on the environment;
2. resume of the EIA published as booklet for further consideration and discussion by broad public.

The latter permit to involve public layers in decision-making and make EIA more fair.

## New Publications Announcement

1. *Science and Technology Management*. Edited by *Alexandru T. Balaban, Eustratios N. Carabateas, Florin T. Tanasescu*, 1998, 243 pp., ISBN 90-5199-372-2, IOS Press, Van Diemenstraat 94, 1013 CN Amsterdam, Netherlands.
  2. *Transforming Science and Technology Systems – the Endless Transition?*. Edited by *Werner Meske, Judith Mosoni-Fried, Henry Etzkowitz, Gennady Nesvetailov*, 1998, 375 pp., ISBN 90-5199-370-6, IOS Press, Van Diemenstraat 94, 1013 CN Amsterdam, Netherlands.
  3. *Geographical Information '97: From Research to Application through Cooperation*. Edited by *S. Hodgson, M. Rumor, J.J. Harts*, 1997, 1514 pp., ISBN 90-5199-331-2, IOS Press, Van Diemenstraat 94, 1013 CN Amsterdam, Netherlands.
  4. *Ethics and Accountability in a Context of Governance and New Public Management*. Edited by *Annie Honddeghem*, 1998, 299 pp., ISBN 90-5199-419-2, IOS Press, Van Diemenstraat 94, 1013 CN Amsterdam, Netherlands.
  5. *Advances in Information Technologies: The Business Challenge*. Edited by *Jean-Yves Roger, Brian Stanford-Smith, Paul T. Kidd*, 1998, 934 pp., ISBN 90-5199-385-4, IOS Press, Van Diemenstraat 94, 1013 CN Amsterdam, Netherlands.
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6. *Environmental Economics*. Edited by *L. Hens, L. Melnik, E. Boon*, 1998, 495 pp., Naukova Dumka, Kiev, Ukraine.

