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Economics for Ecology
ee 18th

Papers presented at 18th International Scientific Conference in Sumy

ISCS 2012
April 27–30

Under support of the joint project of European Union and United Nations Development Programme "Community Based Approach to Local Development"

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Рецензенти:
С. М. Ілляшенко – доктор економічних наук, професор Сумського державного університету;
Є. В. Мішенін – доктор економічних наук, професор Сумського національного аграрного університету

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Sumy State University. Faculty of Economics and Management
Baltic University Programme. Uppsala University
Sumy Local Youth NGO "Council of Young Scientists"

18th International Scientific Conference
"Economics for Ecology"
ISCS'2012

"Економіка для екології"

Матеріали
XVIII Міжнародної наукової конференції

(Суми, Україна, 27–30 квітня 2012 року)

Суми
Сумський державний університет
2012

18th INTERNATIONAL SCIENTIFIC CONFERENCE

"ECONOMICS FOR ECOLOGY"

(ISCS'2012)

April 27-30, 2012, Sumy, Ukraine

The conference organizers:	• Sumy State University (Economic and Management Department) • Baltic University Programme. Uppsala University • Sumy Local Youth NGO "Council of Young Scientists"
Support	• EU and UNDP Project "The Community Based Approach to Local Development - II Project (CBA)"
The topics of the conference:	• State Environmental Policy • Problems of Education, Ecological Education • Rational Economics and Saving Technologies • Informational Economics • Greening Economy, Greening People • The Mechanisms to Reach Sustainable Development • Regional Ecology • Ecological Economics and Marketing in the Context of Globalization • Interrelation of Economy and Culture • The Role of NGOs on the Way towards Sustainable Development
The conference is directed to:	students, young researchers, representatives of youth organizations and NGOs
Conference languages:	the official conference language is **English**
Conference place:	Sumy State University

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Program of the 18th International scientific conference "Economics for ecology" (ISCS 2012)

Friday, April 27	Arrivals, Opening & Plenary session
08:00 – 12:00	Registration of the participants
12:00 – 13:30	Official conference opening
13:30 - 14:00	Excursion around SSU
14:00 - 14:45	Lunch
14:45 – 15:00	The draw of teams-participants of Debates
15:00 – 17:30	Debates, Plenary session
18:00 – 18:30	Departure to the recreation center for settlement
18:30 – 19:00	Accommodation
19:00 – 20:00	Dinner
20:30 – 23:00	Ukrainian party
Saturay, April 28	Conference Working Day
09:00 – 10:00	Breakfast
10:00 – 14:00	Workshops
14:00 – 15:00	Lunch
15:00 – 17:00	Debates
17:00 – 19:00	Conclusions, rewarding
19:00 – 20:00	Dinner
20:30 – 23:00	International party
Sunday, April 29	Excursion Day
08:00 – 09:00	Breakfast
09:00 – 18:00	Excursion (Sumy region)
19:00 – 20:00	Dinner
20:30 – 23:00	Farewell party
Monday, April 30	Departure
09:00 – 10:00	Breakfast
09:30	Departure to Sumy

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ECONOMIC FEASIBILITY OF SOLAR POWER PLANTS IN IRAQ

Thareef J. Mohemmed Althabhawi
Sumy State University
Dijla Jasim Mohammed, Sanaa Jasim Mohammed
University of Kufa

Demand for electricity in Iraq has been stimulated by a growing economy and increasing number of population. In addition, electricity is subsidized in Iraq, which leads to increased demand. Nowadays the output of electricity sector in Iraq averages more than 8500 MW, while the demand is typically more than 14000 MW. Energy deficit in Iraq increased since 2003, when in the war was destroyed electricity network (Fig.1)

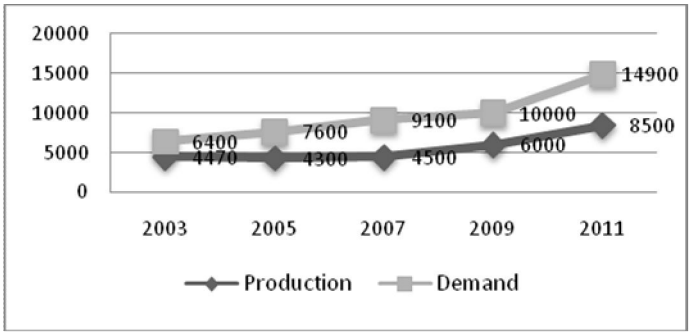

Figure 1. Dynamics of electricity production and electricity demand in Iraq, 2003 - 2011, MW

About 2400 MW of electricity Iraq gets from other neighboring countries, but that's not enough to meet the ever increasing demand. Deficit of electricity hinders the development of industry. Lack of electricity tends to affect more severely the most vulnerable groups of Iraq's society and increases their morbidity and mortality.

Iraq has 32 power plants - thermal, gas turbines, hydroelectric, and diesel power stations. The majority of the existing power plants are thermal plants that use crude oil supported by gas-fired and hydro plants. They produce approximately 80% of electricity balance of country. Thermal plants in comparison with other plants have several advantages. First, the thermal plants require less capital investment than other plants. Second, the thermal plants can be built anywhere, regardless of the availability of fuel. Third, they take up smaller area than hydroelectricity. And finally, the forth, the cost of electricity is less than that of diesel power. However, if such benefits, they have drawbacks. The cost of

electricity generated at thermal power plants (crude oil) exceeds the cost of electricity from other types of power plants (Table 1).

Moreover, fuel prices are very volatile. In addition, thermal plants significantly pollute the atmosphere, releasing into the air large amounts of smoke and soot. The maximum, daily average and annual average concentrations of pollutants in the air varied over a wide range from acceptable to the excess of the maximal allowable levels ten times at a distance of 1000 km from the thermal power plant in Basra and Baghdad. This makes actual the search for other ecologically safe energy sources.

It should be noted that there is a continental climate in most parts of Iraq and tropical climate in its southern regions. Iraq has high rate of solar energy. The specific power of the solar energy reaches up to 1900 - 2200 kWh/m^2.

Table 1 –The cost of electricity produced by power plants of various types

Types of power plants	Electricity cost, EUR /kWh
Thermal plants (crude oil)	0,51
Thermal plants (natural gas)	0,39
Thermal plants (coal)	0,41
Large hydropower plants	0,14
Small hydropower plants	0,27
Solar power stations	0,24
Biofuel power stations	0,52
Nuclear power plants	0,22
Wind	0,10

We compared the operating costs of the power plants at the diesel fuel and solar power.

Baseline data: estimated time of operation - 25 years.

Diesel power: peak power - 6 kW, energy consumption - 300 kWh / month, permanent power supply, the cost of diesel power station - $ 4500, the cost of diesel fuel - $ 0,35 / liter, fuel consumption – 1,5 liters/ hour, the resource of a diesel power - 8000 hours (1 year), battery life is 2,5 years, the price of battery - $30, maintenance: oil , adjustment of filters - $ 200/ year.

Solar power: peak power – 6 kW, energy consumption – 300 kWh/ month, permanent power supply, inverters cost - $4500, average annual solar radiation of 120 kWh/m2 per month, energy production of panel - 15 kWh/ month , the number of solar panels - 20 , the cost of solar panels 20 x $355 =$7100, solar resource batteries- 25, inverters - 10 years, the number of batteries - 8, battery life - 10 years, the cost of battery $2000, maintenance: cleaning the solar panels, small repairs - $50/ year.

As shown by our calculations, only the first year cost of the equipment and operating of diesel power station slightly lower than operating and equipment cost of the solar power station and at the three year of work cost will exceed the

operating and equipment cost of the solar power station. Solar power plant does not emit harmful substances, does not pollute the environment, operating expenses include only periodic cleaning of the facial surfaces of solar panels and replacing corroded contacts, planned replacement of inverters and batteries every 10 years.

This gives grounds for implementation sun energy projects for electricity generation. It is interesting that the efficiency of modern solar power station nowadays reaches up to 14,4%, however 5 years ago at the height of the popularity of solar modules their efficiency does not exceed 10%. It is believed 5-10 years later, this index closer to 30%. Due to new technologies introduction quite naturally the cost of electricity will fall. Such prospects in the development of solar energy make it one of the most attractive destinations in attracting foreign investment. An important advantage of the solar power station for Iraq is the ability of local electricity generation, which could decentralize the power systems in Iraq, as a result great losses of energy could disappear when transporting electricity.

IMPLEMENTATION OF THE ECOLOGICAL AUDIT IN UKRAINE

I.V. Basantsov, PhD, I.O. Pryhara
Sumy State University, Ukraine

The important direction of the state strategy of the development of Ukraine, directed on the balance direction of socio-economic tasks for the future and preservation of an appropriate quality of the environment is the use of ecological audit as a tool to provide quality of the environmental climate. It acts as a basis for the formation and the development of environmental business, the scope of which should include the development and the implementation of resource saving and environmentally safe technologies; the production of the protective equipment and devices for monitoring and improving environmental quality; the production of environmentally friendly consumer products; the use of recycled materials; the use of recreational resources; providing ecological services (environmental monitoring, audit, insurance, consulting, education).

The activities in the field of the ecological audit can play an important role in the development of investment processes. Already today the western investors are starting to demand the confirmation from the Ukrainian enterprises not only economic but also environmental sustainability. The effective enterprise activity in the area of ecological audit is seen as an important guarantee of the ecological safety and environmental risk management capabilities in the design, construction and operation of industrial facilities. An ecological audit is actual for banking institutions, because the financial risks directly related to the environmental. As a result of environmental pollution, major accidents or technological disasters, as well as not considered earlier environmental requirements investor can be involved in civic responsibility, which is extremely dangerous for banking institutions

decrease risk and / or loss of trust, a reputation. The positive audit report in this case plays an important role and for the bank, and for the enterprise, as a necessary condition for obtaining investment. Also promising areas of the ecological audit in Ukraine is its use in the system of the ecological insurance by preparation of ecological insurance contracts, developing plans for preventive measures to reduce environmental risks; in evaluating the damage of the insured event for businessmen in connection with pollution of the environment, the system pricing; in the formation of funds of the ecological rehabilitation of the enterprises; in the system of environmental certification in the general audit of accounting documents etc. It should be emphasized that on a way of Ukraine's entry into the European Union, the state should prove the right to it by the adequate obligations and actions. First of all it concerns the introduction of European standards of the production, the environmental protection, thinking and living.

The emergence of an independent audit in Ukraine in 1992 marked the first attempts at introducing the ecological audit procedures for the analysis of foreign experience. Legal institute of an ecological audit started to develop in Ukraine on 24 June 2004, when it was adopted the Law of Ukraine "On the ecological audit." Till that time even the term "ecological audit" in the legislation of Ukraine was not used, although the ecological audit activity is carried out. And its legal basis for the adoption of the Law of Ukraine has been adapted to international standards ISO (the international standards, this was granted legal registration as an ISO): first - EN ISO 14010-97 «Guidelines for the implementation of the ecological audit. General principles", which came to replace a single standard EN ISO - 19011:2003 «Guidelines for auditing quality management systems and (or) environmental management". Upon Ukraine's accession to the World Trade Organization (WTO) in May 2008 began a new phase in the development of a national ecological audit. This is largely due to the fact that WTO accession caused the withdrawal of some Ukrainian companies on the international markets and the need in this regard to obtain the corresponding certificate of the environmental safety of the production and products.

Today, however, based on a study of a large amount of information, analytical literature, expert opinions one can quite reasonably confirm that the legal base of ecological audit is far from perfect, and the development of the activity on the formation of a new improved database is now practically suspended. The further development of the ecological auditing is impossible without solving the state level of some important tasks, including full support (by the executive authorities) of economic activity, which introduces a quality system based on national standards of ISO 14000.

Therefore, the ecological audit may positively have an influence on the formation and development of various environmental services market in Ukraine, including services in the field of the environmental management, the ecological certification and insurance, the financial and ecological audit, the environmental consulting, education and training etc.

COMPLEX ENVIRONMENTAL-ECONOMIC APPROACH TO SOLID WASTE RECYCLING VALUATION

Oleksandra Bilopilska
Symy State University, Sumy, Ukraine

Complex recyclingof solid wasteis the most promisingsolution to the problemsof waste, providing energy-saving technologiesof rawcomponentsin the compositionof solid waste. The advantageof complex solid wasterecyclingis theuniversalenvironmental andeconomic assessment ofthe most commonindustrialrecyclingtechnologies- burning, composting, mechanizedsorting, andcombinations of them.

Implementation ofeconomic calculationsprovidean objectivequalitativecomparative assessmentof different technologies, using them as part oftheir goals.

The mainworld tendency in the solution of solid wasteproblemsaimstoinvolve it intoindustrial recycling. First of allmunicipal solid wasteare involved inindustrial recyclingin regionsthat arepooron natural resources, have a smallarea andhigh population density. The main tasks for the technologicalsolid wasterecyclingare: 1) reduction of volume ofwasteto be disposed, and 2) neutralization ofsolid waste, and 3) a rationalwaste management.

Key indicators ofwasteless technologiesareecological andeconomic criteria-environmental safetyof technology,and environmental safetyofnew products, economic efficiency, capital and operating costs. Practicalsolution of the problemof industrial solid wasterecyclingconnectedwith largecapital investments, so that all costs shouldbe focused onthe progressivecreating of industrial production. Industrial recyclingshould be consideredas the finaloperation ingeneral scheme ofsolid waste management, the effectiveness of which depends onthe organization of workat eachprevious stage- collectingand sorting.It isa complexprocessing ofsolid wasteasa combinationa systemof collecting,sorting,heat treatment,fermentationand otherstepstaken togetherprovidea low waste production for maximum efficiency andenvironmental friendliness.

The main resultsof this work are:

1. The classification ofthe traditional ways ofdisposalof solid waste.
2. Methodologicalapproaches to determining theenvironmentaland economic benefits ofrecycling technologiesof solid waste.
3. A comparative evaluationof environmental and economicefficiency of differentmethods ofsolid waste disposal.
4. The ways ofoptimizing the impact ofsolid wasteon the environment.
5. Prioritizedway todisposal of solid wasteon the basisof ecological and economicmethods.

THEORETICAL FOUNDATIONS OF THE MECHANISM OF ENTERPRISE SUSTAINABLE DEVELOPMENT ON THE BASIS OF SYNERGETICS

T.V. Bondar
Sumy State University, Ukraine

Recently, manifestations of the contradictions of the global economic system at all levels the synergetic paradigm of scientific thinking acquires increasing significance. The main postulate of this interdisciplinary direction of research is that the systems have a structure of modification trend from simple to complex. Modification of system structure may occur due to spontaneous self-organization of system as a result of its openness. Therefore, one could argue that the system structured initially own evolution (in the project state) have a potential value and internal trends of improvement and modifications of its own structural organization. In accordance with trends and external factors of development the system selects an alternative of its own self-organization at a time, being in a particular state of order. The processes of the system are directed to support system viability.

However, based on the principles of synergy and system development methodology, we can conclude that the economic system in contemporary theory and practice of social organization are not considered as systems in their entirety, that is not considered from the standpoint of the fundamental principles of their functioning. Natural principles of economic systems in their dialectical relationship to economic and social aspects of the system are the fundamental basis of their functioning. The principles of natural economic systems are implied in the space-time relation and at the system level are not included in the process of alternatives choice. In planning the development of enterprise various factors are complex considered, but they are unbalanced due to structural imbalances that are available through the existence of systemic contradictions, such as social, environmental, economic, socio-environmental, socio-economic, environmental and economic. Under these conditions, raises the problem of formation mechanism for sustainable development of enterprises to ensure their effective functioning in the long run.

Define the key concepts that form the basis of theoretical positions of the mechanism of sustainable enterprise development formation in the long run, such as the balanced development of the enterprise, trend, vector and gradient of development and life cycle of the enterprise. Balanced development of the enterprise means planned and system development options of which meet certain of its proportions in definite spatial and temporal characteristics. Vector of development characterizes the structural and target dynamics of enterprise potential for the chosen parameters, and the gradient of development determines the direction, nature and magnitude of change of the potential parameters (coordinates of development vector). The criterion of balanced development of the

enterprise is a complex indicator of the enterprise development, which is based on the product of cumulative indicators of system elements (their potential), the coefficients of their relevance and their variance from the projected development vector based on an internal trends of the system development. Trends can be determined based on the potential for static systems based on the properties of the design structure of the enterprise and wide links.

Considering these conceptions the mechanism for balanced development of the enterprise should be defined as a system of methods, levers and instruments to influence the structural organization of the enterprise in time and space according to each stage of the life cycle of the enterprise, based on nonlinear principles of the organizational form and aims to ensure structural rationality in the process of enterprise development.

Theoretical foundations of mechanism to ensure sustainable development of enterprises, in our opinion, are:

1 It is important to investigate the substrate of enterprise, that is the primary basis for its design and review stages of its evolution. The next step is to identify the structural elements of the enterprise organization from the standpoint of a system approach, analysis of overall direct and inverse relationships with the enterprise environment, determine the actual mechanism and key factors for enterprise development.

2 It is necessary to justify from a methodological point of view of criteria balancing enterprise development in space and time and distribute the cumulative value of criterion indexes (predictive results of the enterprise performance) according to the stages of the life cycle of enterprise on the basis of forecast of typology and quantitative characteristics of the external factors with regard to their structural hierarchy.

3 To determine potential of enterprise development based on analysis of actual structural organization of the enterprise, the mechanisms and factors of its evolution. Based on the definition of potential and forecasting of external factors in the structural and dynamic aspects it is necessary to form internal trend of enterprise development. Subject to quantify trends it is important to determine the vector of development and the power of synergy of internal elements of the enterprise in time and space. It is necessary to quantitatively determine the trend of enterprise development and to form its own vector development. Based on the definition of the relationship between elements of the structural organization of the enterprise and coordinates the vector of its development to establish the gradient of the enterprise, which describes the nature and direction of evolution of the enterprise.

4 Balanced criterion of development, cumulative indicators of enterprise functioning and the gradient of the enterprise is the basis for the development of methods, levers and instruments of management for each stage of the life cycle of the enterprise. On this basis it is possible to designing stages of the life cycle of an

enterprise from the standpoint of the criteria and functional aspects of the enterprise development.

Thus, these theoretical position, in our opinion, is the basis of the formation of mechanism of sustainable enterprise development in the long run.

THE INFLUENCE OF INSTITUTIONS ON CIVIL SOCIETY IN MAKING DECISIONS IN ENVIRONMENTAL LOCAL AUTHORITIES (PRACTICAL ASPECTS)

Volodymyr Chepik
Sumy State University, Sumy, Ukraine

Politics of the local government plays the important role in developing environmental resources of towns as for the disposal of land, which by its purpose or beneficial use is assigned to the green areas of settlement (parks, gardens, lawns, landscaping neighborhoods and coastal areas of local ponds).

Unfortunately, most business entities in the modern market economy of our state ignore the issue of rational use of land resources of local communities. The purpose of profit or satisfaction of their own (individual) needs in most cases, puts aside the environmental issues of the society.

Sumy is no exception. Thus, in recent years, influential businessmen and officials are actually engaged in the politics of destruction of greenery areas of our city. Each year the mass media ascertain the discontent of the inhabitants of our city as for decisions adopted by the Sumy city council on the allocation of land for the construction of blocks of flats, dwelling houses, shopping centres, individual housing in recreational areas of our city: blocks of flats on the shores of the Lake Chekh (2006), individual residential buildings in the area of the Basivskyi Park (2008), homestead buildings on the Krinichnaya - Lunacharsky Street (2008 - 2009), buildings on the banks of the Sumka river in the centre of the city on the Pivdenna and Luhova streets (2009-2010), blocks of flats along the Psel river on the D. Korotchenko Street (2011), construction of the commercial office centre on the Kurska Street (2009-2012).

Nowadays most of these projects are left without intervention of the public at the stage of the construction beginning. Unfortunately, correspondent decision about the allocation of land with green space are taken by local government without taking into account the statements of the general plan of Sumy city and discussion of the matter with the local community of the city. Thus, the majority of areas, which by their functional purpose are assigned to the areas of rest and recovery of the population, find themselves in possession or use of private individuals. Meanwhile, the position of active citizenship is to prevent the construction of the recreation sites for population leads to considerable loss of business entities (expenses for land development and project documentation,

involving material and human resources as for the planning and implementation of commercial projects, etc.).

Taking into account the above-mentioned information, one can conclude that it is necessary to follow the balance of local authorities the interests of the public and businesses in making decisions about natural resource communities.

In early 2010, the active participation of the Expert Committee of the Public Sumy City Council on environmental improvement provided the decision of the City Council "On Moratorium on the change of the target land use in Sumy city" dated 14.02.2010 No. 3620-MR. This decision was made to prevent negative changes in microclimatic conditions, destruction of natural systems and landscapes, to preserve their values and biological diversity, sustainable use of natural objects, to prevent mass construction of green areas of the city.

It should be mentioned that the commission began its work as an advisory body in matters of the city ecology, and completed as an active participant in the process of developing the above-mentioned decision. The company's decisive point of lobbying of the project was the decision to send an open letter to the mayor and members of Sumy City Council to demand to stop the destruction of green plantings in Sumy city which, considering the arguments, preferred the public opinion.

THE ECOLOGICAL FOOTPRINT

Isabel Chikoti
Sumy State University, Sumy, Ukraine

When one talk about challenges of sustainable development a vital point comes to mind: the fact that humanity has the ability to sustain natural resources regardless of the fact that they are scarce.

Nowadays there is a common misconception in our society that preserving the environment is somehow linked with compromising on economic terms of a country, city or community. This very belief has fuelled the countless debates "Economy versus Environment". However, the opposite is true to this perception of ours. In reality, there is enough that the planet earth can provide us to satisfy our needs. Our economy can prosper and sustain in the long run without putting undue stress on the natural resources. It is the epidemic of greed to possess and enjoy as many luxuries as possible that has led to the state in which we find ourselves today - scarcity. The use of green technologies and renewable sources of energy should solve the energy crisis to a great extent without putting any burden on the existing natural resources. It means the economic growth of the country/region doesn't get hampered owing to environmental concerns.

But one must be aware about globalization and its impact on the environment.

The concept of the Ecological Footprint can help to find the optimal level of consumption to reach sustainable development. The Ecological Footprint has emerged as the world's premier measure of humanity's demand on nature. It measures how much land and water area a human population requires to produce the resource it consumes and to absorb its carbon dioxide emissions. It shows how many planets we would need if everyone lived like you.

The Ecological Footprint is rooted in the fact that all renewable resources come from the earth. It accounts for the flows of energy and matter to and from any defined economy and converts these into the corresponding land/water area required for nature to support these flows. The Ecological Footprint is defined as "the area of productive land and water ecosystems required to produce the resources that the population consumes and assimilate the wastes that the population produces, wherever on Earth the land and water is located". It compares actual throughput of renewable resources relative to what is annually renewed. Non-renewable resources are not assessed, as by definition their use is not sustainable.

More precisely, your ecological footprint is the area of viable, functioning land and water ecosystem that it takes to sustainability: produce the resources you consume, and detoxify, restore and recycle the wastes that you produce. Everything around you is derived from, and eventually returns to, nature.

Figure 1. The Ecological Footprint

Your ecological footprint components comprise the choices you make to sustain your way of life. The area of earth's ecosystem that your life uses up - your ecological footprint - depends on the amount of resources flowing into your life as consumption and out of your life as waste.

So a refined measure of it would include careful account of how you dispose of your waste, how much is recycled and the ecological impact (noxiousness and toxicity) of your waste. However, because the amount of waste you produce is directly affected by the amount of resources you consume, we can estimate your ecological footprint based mainly on your consumption habits. The main ecological footprint components that determine how much of the planet must be dedicated to sustaining your lifestyle are food, goods, shelter and mobility.

The Ecological Footprint is not a precise measure of ecological sustainability. While it is perhaps the best estimate to date, it is important to recognize its limitations. In general, the Footprint underestimates the impact of human activities on the biosphere. But it measures how fast we consume resources and generate waste.

The most challenging things to overcome in developing in a sustainable way is how do we maintain the same living standards and at the same time become innovative enough to "down scale" on the usage of energy and other resources in a way that will still meet all our current needs.

Supervisor: Nadiya Kostyuchenko

SUSTAINABLE CITIES

Alllan Chisakula
Sumy State University, Sumy, Ukraine

A sustainable city, or eco-city is a city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water and food, and waste output of heat, air pollution - CO_2, methane, and water pollution.

There remains no completely agreed upon definition for what a sustainable city should be or completely agreed upon paradigm for what components should be included. Generally, developmental experts agree that a sustainable city should meet the needs of the present without sacrificing the ability of future generations to meet their own needs. The ambiguity within this idea leads to a great deal of variation in terms of how cities carry out their attempts to become sustainable. However, a sustainable city should be able to feed itself with minimal reliance on the surrounding countryside, and power itself with renewable sources of energy. The crux of this is to create the smallest possible ecological footprint, and to produce the lowest quantity of pollution possible, to efficiently use land; compost

used materials, recycle it or convert waste-to-energy, and thus the city's overall contribution to climate change will be minimal, if such practices are adhered to.

Environmentally, sustainable transportation is now mainstream. The sustainable cities movement has brought the environmental movement into the city and focused their attention on the myriad of local and regional problems associated with automobile dependence. Globally the attention of the world has been focused on the potential climaxing of oil production and on climate change, the Kyoto agreement now sets all developed nations into a pathway of reducing energy. The biggest single technology causing greenhouse emissions is the automobile and it is the hardest for nations to recognize as the culprit. But as the process of reducing emissions becomes more and more mandated down to local level the need for planners and transportation engineers to find ways of reducing car use will be on the agenda. For many years there has been an implicit assumption amongst transport planners, engineers and economists that there is a close link between mobility and wealth. This leaves very few policy options open to cities for managing growth in car use. However, the data for such assertions tends to be national data and is rather selective.

We will examine the link between mobility and wealth by comparing the per capita use of cars in 37 global cities and see how this compares with their per capita city wealth (called Gross Regional Product or GRP ie, the total goods and services in that city/region, which in the US for example is the full SMSA region). It is found that there is only a weak positive linear correlation between car use and wealth which only explains 18% of the variance and is therefore not particularly significant in terms of policy implications.

As already outlined, North American and Australian cities have considerably higher car use per capita than European and Asian cities. It is higher than would be expected just considering the level of economic activity or wealth, especially in comparison to the European and developed Asian cities in the sample (ie Tokyo, Singapore and Hong Kong).

The large US cities in this sample have: 1.66 times higher car use than the major Australian cities but are only 1.36 times higher in GRP; 2.17 times higher car use than Metropolitan Toronto but are only 1.19 times higher in GRP; 2.41 times higher car use than the average European city but actually have only 0.85 the level of GRP per capita; 7.3 times higher car use than the wealthy Asian cities but have only 1.26 the level of GRP.

Waste reduction such as "Scrap Lumber Collection: The City of Aberdeen, Maryland set up a demonstration project to collect scrap lumber at curbside. In addition to diverting a significant amount of waste from the landfill, the city worked with community volunteers to make birdhouses and backyard composters. Wood was also given to local non-profit organizations for trail building and other purposes. And "Newspaper Deposit Charge: The Post Newspaper in Zambia added a five-cent charge to their daily newspaper price. When residents are finished reading the paper, they can return it to be recycled for a three-cent refund. The

deposit income supports a community-run association that operates the collection depot.

Green Builder Program aims at Energy Efficiency and Renewables: The Austin Green Builder Program in Texas provides training in energy-efficient and environmentally-responsible construction techniques. Participants receive guidebooks, product and service source books, and attend workshops and training seminars. Builders and developers can apply the Austin Green Builder rating system, awarding one to four stars to their houses. The program is so popular, it has generated greater participation among builders, architects, engineers, and building-products suppliers.

Energy Policy: In April 1990, the City of Portland, Oregon adopted an energy policy with the goal of 'increasing energy efficiency in all sectors of the City by 10 percent by the year 2000 so as to enhance the livability, economic strength and well-being of the City's residents and businesses and reduce environmental problems, such as air pollution and emissions that contribute to global warming.

"Local Energy Supply Program: Saarbrucken, Germany has an aggressive Local Energy Supply program that requires conservation, district heating, and local energy supplies. Over 40,000 homes are served by district heating, and the homeowners can receive subsidies to install rooftop solar-energy panels.

However, sustainability outcomes in cities do not just depend on technology and design, but on human behavior, market mechanisms, public policy, as well as the natural system. Complex interactions between people, urban infrastructures and the natural environment shape both the environmental sustainability and adaptive capacity of cities.

Supervisor: Nataliya Vernydud

SIGNIFICANCE OF REGIONAL LOGISTIC SYSTEMS FOR THE ECOLOGICAL AND ECONOMIC DEVELOPMENT

J. Chortok, A. Rodymchenko
Sumy State University

At the present stage of development to strengthen the international position of Ukraine's economy and its regions are environmental and sustainable economic growth. That is why the study of the development and implementation of regional logistic systems is so important.

In developed countries, transport and logistics companies are investing in green technology that reduce costs and improve its image. They buy vehicles with lower fuel consumption, switching to alternative forms of energy, offering clients meet together in search of "clean" solutions.

Since each region has its own peculiarities of economic and geographical position, natural resources, technological capacity, so solving problems of each region is possible by developing and implementing strategies regional logistic systems that will provide effective environmental and economic development. The main strategies are the following:

- The strategy of globalization, leadership, inter-regional integration;
- Strategy of intensifying economic flows;
- Strategy for software and information;
- Strategy for increasing logistics capacity.

Implementation of regional logistics strategies will allow to reduce the cost of sales and delivery of goods, such as to improve the supply chain in the chain "producer-consumer" and thereby reduce pollution.

The role of regional logistics systems to ensure ecosafety development of the region should provide:

1) reduction of environmental pollution by vehicles;

2) ensuring sustainable development in the country by implementing environmental and economic policies;

3) exploring the structure and elements of ecological and economic potential of areas;

4) investigation and evaluation the level of incorporation of environmental goals in regional development plans;

5) identification key areas of state policy in the development of regional logistic systems;

6) ensuring minimal environmental damage.

Advantages of the use and implementation of RLS is to improve the ecological development of the region, such as reducing ecodestructive impact and ensure environmental protection by improving the transport system of regions, ie the formation of sustainable development, because increased logistics flow increases burden on the environment.

INTELLECTUAL POTENTIAL AND CREATIVE ENVIRONMENT OF SUSTAINABLE INNOVATIVE DEVELOPMENT

Pavlo Denysenko
Sumy State University, Sumy, Ukraine

Nowadays innovative activities in the conditions of so called knowledge economy can be distinguished from those held during early industrial era. Innovative development today is the result of cooperation of brilliant creative individuals with each-other or their groups with different organisations and institutions involved in this collective innovation process of social capital application [1] mostly within its intellectual aspect. As a result, a permanent flow

of recently appeared knowledge and information becomes naturally crucial factor for innovatively targeted development in the knowledge economy. In everyday working life it means mutual exchange of professionals and intellectually creative people among innumerable innovation processes. It may be pointed out in accordance with many scholars that big cities and large scale diversified companies of research institutions may play a special role as knowledge, intellectual and innovation nodes. So intellectual potential of business, administrative or regional socio-economic-environmental systems becomes a factor to be included into strategic decision making in the conditions of knowledge economy.

The modern environment of business activities as the main field for innovative development is characterised by:

- Rapidly changing technological conditions of market competition.
- Growing awareness and sophistication of customers.
- Shift of competition towards secondary and tertiary values of products (e.g. service activities before and after purchasing the product).
- Increasing dynamics and uncertainty of corporate decision making. [3]

Taking this into account, the separation of managerial knowledge used by top administrators to develop general strategy and technological knowledge used by middle level managers and executors to implement emerging innovations into working process within the frames of accepted strategies may be an example of a growing theoretical and paradigmatic gap between natural, life and social sciences and research. The managerial perspective must be also based on a deep understanding of technological processes. So the practical challenges between social sciences and technology in the knowledge civilisation age require just the opposite, an integration of these two managerial perspectives.

Each knowledge creation process depends critically on the intellectual heritage of humanity. The individual, group and heritage knowledge – elements of the social dimension of knowledge creation processes – can again be classified as rational, intuitive, and emotive. This three-by-three Creative Space [2] matrix we tried to fill with elements of socio-economic-environmental systems innovative development (see Table 1).

The concept of Creative Environments [3] is related to systems of tools that support creativity It includes both the informational technologies aspect and the social aspect, referring both to social interaction in knowledge creation (with the fundamental role of the intellectual heritage of humanity) and to the participation of future users of this knowledge system.

Applying mentioned tools for studying special elements included into this model we may more deeply investigate the role of intellectual potential in the economic-environmental system for its sustainable innovative development.

Table 1 – The Elements of Knowledge Creation Process in Socio-Ecolo-Economic Innovative Development

KNOWLEDGE		**Dimensions**	
Levels	**Emotional**	**Intuitive**	**Rational**
Individual	Personal socio-economic-environmental preferences, motives and choices as a result of real-life experience	Ideas and inventions appearance, implementation or support	Inclusion into everyday routine with personal adaptation r even improvement
Group	Commonly shared emotions, opinions regarding local socio-economic-environmental situations and motivations for being included into common action	Acceptance and distribution of the most attractive responses to the socio-economic-environmental issues with sharing of the most valuable and validated ideas of the time	Current strategies and tactics formulation, specification, monitoring of implementation process and improvement for further decision-making
Heritage	Accumulation of emotive and experience heritage of different socio-economic-environmental systems	Level of commonly shared ideas and images before their scientific rationalisation	Accumulation of large scale factual patterns and formulating global development priorities

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ECOLOGICAL – ECONOMIC CLASSIFICATION OF AREAS OF FOREST RESOURCES ENERGY USE

Oksana Dynka
National Forestry and Wood Technology University of Ukraine

The essence of ecological-economic approach to the classification of areas of forest resources energy use is realized through the ecosystem approach to nature management in general and forestry in particular, which was grounded by Acad. Y.Y. Tunytsya in the 1970s [1]. In the context of ecological – economic approach to nature management which was determined as a ternary process of "use, protection and reproduction of twofold components of ecological-economic system – natural living environment and natural resources" by Academician Y.Y. Tunytsya [2, c. 116], forest is described as an organic unity of forest raw resources (wood, non wood plant resources, fauna) – DMF components and different useful functions of forest – R components, namely its influence on living environment (services of general social use)

The meanings of the terms "Use of forest energy resources" and "Energy use of forest resources" are specified based on the ecological - economic principals of classification of nature management areas. The term "Use of forest energy resources" means the use of most components of resources of wood origin (subsystems of D element of DMFR system) and some components of non wood plant origin resources (subsystems of M element of DMRF system) and their processing products as a source of heat and energy in everyday life and economic activity of a man.

Wood energy resources are used in two main directions. The first one is the direct use of such energy wood resources as woods, fuel chip and also the production of fuel briquettes and wood granules – pellets out of these resources. It is influenced by the development of European market of wood granules, which is 8 million tons per year, out of which 400 thousand is exported by Russia, 80 thousand tons by Byelorussia, 50 thousand tons by Ukraine. In 2020 the capacity of European market of wood granules is estimated at least as 80 – 100 million tons [3].

The second direction is a deep thermal and biochemical processing of wood and non wood primary resources, which help to obtain products with new consumer energy properties. It includes the production of charcoal, generator gas for use as fuel in water heating and steam boilers, as fuel for internal combustion engines and gas turbines and also production of such products as liquid motor fuel, methanol and ethanol, bio diesel fuel.

The term "Energy use of forest resources" has a much wider meaning than "Use of forest energy resources". Saying energy use of forest resources we understand ecological-economic processes which occur during the use of forest as DMFR system as renewable source of resources for the needs of constant energy

supply and also as a component of biosphere which can directly or indirectly influence the ecological – economic processes of the use of other renewable and non-renewable energy resources.

In this sense forest as a DMRF system is viewed as a source of potential renewable energy resources (wood energy resources) and as a unique component of biosphere, which directly influences one of the most important branches of energy supply – hydro power (hydroelectricity) through its water control functions, and allows to save a lot of money for premises heating in winter and cooling in summer through climate control functions (smoothing of temperature extreme values and control of wind flows).

Nowadays one of the most important areas of energy use of forest resources is the suspension of greenhouse gas accumulation in the atmosphere by forest ecosystems including them in the processes of assimilation, the decrease of greenhouse gas concentration and providing stable balance between their formation and absorption in future. In particular, according to the data of researches the annual burning of technically available energy wood resources in Ukraine (2,1 million tons of fuel) provides emission of about 1,7 million tons of carbon, and at the same time the annual deposition of atmospheric carbon (trunks and root systems of trees) in Ukrainian forests is now about 11 million tons [4].

Thanks to its forests, Ukraine has huge reserves for international trade with carbon quotas, and money from their selling will significantly increase the ecological-economic efficiency of stable energy supply of our country.

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ORGANIZING AND ECONOMIC APPROACHES TO IMPROVING OF REGIONAL WATER SUPPLY PROCESSES

Anastasiia Dolgodush
Sumy State University, Ukraine

According to the new UN General Assembly Resolution, accepted in 2010, nowadays the access to the clean drinking water is equated to the fundamental human's rights. Meanwhile, drinking water becomes the scarcest resource, and the provision of its quality turns to the global society's challenge.

The actual water supply problems, inherent to Ukraine, are selected and summarized, consequently, the following *groups of the problems* are presented: 1) economic; 2) administrative; 3) ecological; 4) social; 5) regulatory; 6) territorial. This study focuses on the economic and ecological water supply problems in Ukraine. In accordance to UN standards, Ukraine by its own reserves of surface and ground water is a region, not provided with freshwater in sufficient quantity and quality.

Water supply processes are considered in the system of interconnections of natural, water and economic subsystems. Balance of these interconnections ensures that the water performs a wide range of extremely important life-supporting functions, such as recreational function, use of water for energy, use of water in technological processes, water as an evolutionary environment, water as a component of living organisms, etc. Among named freshwater functions, the certain priority is the *people's provision with the qualitative drinking water*. People's provision with the qualitative drinking water is the strategic interest of any nation, primarily because the human health, by the World Health Organization, is the decisive factor in the characterization of the human capital.

Important to note that in Ukraine sanitary and epidemiological stations analyze the drinking water samples by approximately 20 quality indexes, while National Primary Drinking Water Regulations of the USA normalize over 50 agents, and EU's Drinking Water Directive contains 66 such parameters.

The study presents the regional analysis of the drinking water condition in two parameters, *sanitary-chemical* and *bacteriological*. However, necessarily to admit that sanitary and epidemiological stations' records don't include any results of drinking water quality control right after the accidents, which, unfortunately, are not rarities in Ukrainian water supply systems.

The fact that specific gravity of the *damage to public health, caused by the consumption of unsafe drinking water*, in overall economic damage is about 15%, mustn't be ignored. Firstly, we suggest estimating the ecological-economic damage on *three water supply categories*: 1) artesian water from underground sources; 2) from surface water bodies; 3) from groundwater runoff and close to surface aquifer, not protected from contamination (which rural population is mainly

provided by). The *coefficient of population's awareness about a contamination degree of drinking water* is also taken into account.

Secondly, in prospect, authors suggest to estimate ecological-economic damage to public health, caused by the consumption of unsafe drinking water, by the improved method, which considers the *coefficient of availability of qualitative drinking water* for population. Particularly valuable in new method is the consideration of chemical and bacteriological factor of water contamination. Should be noted, that the average cost of curing infectious diseases is 15-20 times more than curing diseases, caused by chemical contamination of drinking water.

According to the mentioned-above first method, we calculated the annual ecological-economic damage to public health, which particularly for Sumy region makes about 60 million USD. The existence of resulting ecological-economic damage from unsafe drinking water causes the necessity of development of *approaches to its compensation*. Approaches, suggested by authors in the study, include the following: 1) social compensation in the water supply payments the costs of bringing the water to the drinking quality (taking into account that the human's daily need of drinking water is 3-4 l); 2) installation of water treatment systems on the second and third ascents of water and splitting of water supply for drinking and economic needs; 3) governmental distribution of "social drinking water" at an affordable price through the supermarket chain; 4) interest-free loans provision for purchasing the modern individual multistage water treatment systems; 5) access provision to at least one source of qualitative drinking water in the rural terrain.

Additionally, one of the effective ways of damage prevention is the improvement of drinking water sources state. For this purpose, on our opinion, the stimulating of involvement *ecological functions of water sources* is efficient, particularly, using the higher aquatic plants functions as the least capital-intensive and effective way of water ecosystem treatment.

To the practical implementation of measures recommended above, we propose to improve the existing mechanism of water supply, specifically, besides traditional administrative block, financial and economic block as well as resource block, we input to it an *allocative block* on the purpose of optimization water resources in time and space. To our mind, important to distinguish separately the motivational factors, directed to sustainable water use. Should be mentioned, that the *internal motivational factors* are the most efficient, i.e. the stimulating of sustainable water use and recovery processes in water sector is efficient, when inner motivation dominates.

To sum up, the approaches to estimating ecological-economic damage to public health, caused by the consumption of unsafe drinking water, are improved; the efficiency of involvement ecological functions of water sources, is justified; the structure of organizational-economic mechanism of water supply, is improved; as well as the ways of improving economic instruments of improving public water supply motivation, are formed.

FACTORS OF SPREADING OF THE SOCIO-ECOLOGICAL CONCEPT OF THE ENTERPRISE

O.V. Dudkin, T.V. Rudenko
Sumy State University, Ukraine

Social connections and interactions are becoming more complicated and requirements for all members of society are rising in the process of social development. Companies' actions towards these requirements are predicated on the environmental and social responsibility of enterprises. It is impossible to understand the state of the modern business and the role that it can play under the new conditions without analyzing the changes that have occurred over the past decades. The main factors that have caused fundamental changes in the global economic system, led to the revision of the traditional roles of business and promoted spreading of socio-environmental responsibility include:

1. The acceleration of scientific and technological progress. Achievements in the sphere of information technology significantly affect economic relations. Thanks to them, manufacturers are able to get more information about customers and partners, and thus to cooperate with them more effectively. The scope for operating the information increases dramatically. Information technologies can provide us with information about the capital flow, the conditions of production; allow us to make predictions with high confidence level. Nowadays, mobility and speed of movement of capital constantly mounts, which entails gradual integration of individual countries into the global economic system.

The availability of information, on the one hand, leads to the openness of enterprises, on the other hand, makes them vulnerable to any changes. This necessitates a detailed account of all factors that may affect the operation of the enterprise. According to this, companies must quickly respond to the changes in the social, ecological and economic environment.

2. Increasing role of the company staff. At present, human and social capital play the important role not only in operation and development of the company, but also in growth and competitiveness of the national economy. This process is explained by the fact that the competitiveness of companies depends not only on the price factors, but also on the quality factors of products and services. Staff is now seen as a key strategic resource. In accordance to this, the concept of duties, working area, career and motivation of employees is altering. Under the influence of modern communication technologies and owing to the new forms of employment, traditional views about professional development without the change of speciality in one company are changing.

Involvement, motivation and retention of talented employees are becoming more important, because of the shortage of qualified workforce. Companies may use their positive image (which is formed as a result of nature protection activities and socio-responsible operation) as a key element in the recruiting.

3. The need to harmonize interests of many subjects of ecological and socio-economic relations. In modern world, there is diversification of the interests of enterprise, different segments of society, customers and staff. Enterprise functioning depends on the functioning of a wide range of subjects that affect its operation. But companies have their own means of influence. If we consider the relationship between business and society, the only way to the conflict-free existence is to reconcile the needs of as many influence groups as possible with the interests of the company. The risks of doing business may occur there, where the company contradicts the values and expectations of members of society. Entrepreneurs start to understand that there are areas of common interest of society and business. There might be slight differences in motivation, but on the whole, the unity of pursued interests is evident. In addition to profit maximization and cost reduction, sustainable use of natural resources, optimization of the relationships with the range of stakeholders and, ultimately, long-term development prospects are becoming the goals of each business organization.

5. Environmental instability. Mankind now more often faces the problem of the lack of natural resources. It becomes clear that even the great efforts that are directed by the individual national governments cannot significantly change the situation. The negative external environmental effects of operation of enterprises in most cases affect sides that are not directly related to economic activity. As the most important resources for people now cannot be adequately evaluated, they are used irrationally. Industrial activity destroys resources that are in public ownership.

The consolidated activities of international supranational authorities and international organizations that can influence the formation of new concepts in business worldwide are the real possibility to overcome these problems. This way, political and social organizations can limit the activities of the enterprises in the new conditions, by forcing them to use natural resources rationally and to solve environmental problems.

6. The change of the functions of government and business. The attention also should be paid to the interpenetration of the state and big business functions. This is happening owing to the formation of a large number of multinational corporations and international companies. Large business organizations in some cases have a bigger amount of physical capital, infrastructure, land, finance, information resources than the governments of individual countries, and today they are the most influential players in the international arena.

Thus, socio-ecological responsibility of business in Ukraine and all over the world is inextricably linked to the problems of preservation of the achieved positions and of increasing competition in constantly changing circumstances. Socio-ecological responsibility is linking tightly to the corporate strategy. And success of social and ecological initiatives becomes a key to the future economic achievements.

THE USING OF BIOGAS AS AN ALTERNATIVE FUEL FOR REDUCING GREENHOUSE GAS EMISSIONS

O.O. Dudukova, V.O. Splavska, V.V. Dubrovska, V.I. Shklyar
National Technical University of Ukraine "KPI", Ukraine

In Ukraine, annually produce 14 million tons of waste [1] (about 300-400 kg / year per person).

Unsanitary landfills occupy large areas that become unsuitable for agricultural activities or stay near them because they are a source of harmful and toxic substances which pollute air, water and ground. The main component, which is released from landfills is methane, emissions by the atmosphere are one of the main factors of the greenhouse effect.

As a result of capturing landfill gas and its use as a fuel produced large amounts of energy, reduced dependence on energy imports and create new jobs. Implementation of projects for energy recovery of landfill gas to improving the environmental situation: reduction of greenhouse gases and pollutants, which has a positive impact on air quality and reduce the potential risk to human health. At international level there are significant opportunities to expand the use energy of landfill gas.

Objective: Substantiation of expediency of production and utilization biogas from municipal solid waste of landfill number 5 in the village Pidhirtsi, Kiev region.

The results:

• Calculated the potential of areas of municipal solid waste using methods recommended by the International Panel on Climate Change (IPSS). Estimated potential for gas trapping efficiency of 58% is about 3000 m3/h.

• Calculated values of emissions of biogas from MSW areas by a computer program RETScreen [2], which results in the form of a graph shown in Figure 1.3

• Established that without human intervention, biogas will emit to the atmosphere at 6000 m3/h until the waste will be supplied to MSW areas, and after its closure for another 20-30 years with reducing emissions of biogas from exponentially.

• Considered the basic technologies for utilization of biogas, including direct combustion in a power generating facilities with capacity of 5 MW and estimated abroad experience in creating similar projects.

Conclusions:

1. One of the most effective ways to supplement and replace conventional energy resources is the production and use of biogas, which is formed by the use of methane fermentation technology of organic waste.

2. In well-designed landfills can achieve biogas utilization to 75%, which in turn will not get into the atmosphere, which significantly reduces emissions.

3. The use of biogas for the production of useful forms of energy reduces greenhouse gases emissions, which are formed in large Heat and Power station using coal. Amount of reduction of emission is taken into account by using the emission factor, which for power production is 1.355 $mCO_2/MW \cdot h$ [3] and for heat production is 0.0983 mCO_2/MJ [4].

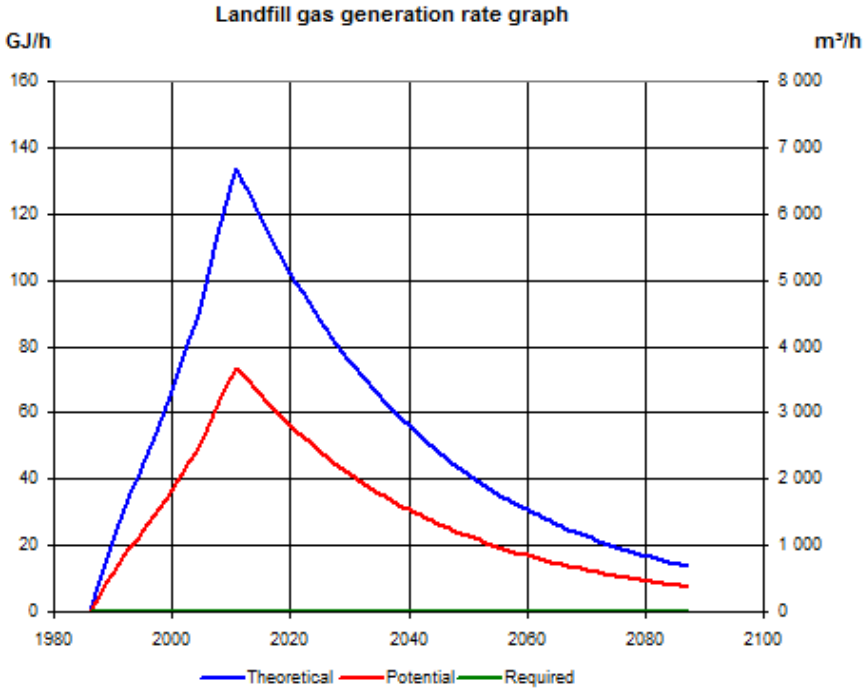

Figure 1. Calculation of the biogas potential by a computer program RETScreen

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NEED OF IMPROVEMENT OF SYSTEM OF PUBLIC ADMINISTRATION IN THE FIELD OF THE CONSERVATION OF THE ENVIRONMENT

Aleksandra Dyldina
Perm State National Research University, Perm, Russia

Development and perfection of management of the conservation of the environment linked with the basic transformations of a society, objective conditions of human development. Executive establishment of control has come to discrepancy with new economic and ecological requirements.

Last decade in the Russian Federation amendments and additions have been accepted to following laws:

– Federal law "Concerning the Protection of the Environment" d/d 10.01.2002 №7 – Federal law (F.L.);
– Federal law "On Protection of Atmospheric Air" d/d 4.05.1999 № 96 – F.L.;
– Federal law "Concerning Fauna" d/d 24.04.1995 № 52 – F.L.;
– Federal law "Concerning Ecological Appraisal" d/d 23.11.1995 № 174 – F.L.;
– Low "Concerning Subsurface Resources" d/d 21.02.1992 № 2395 – 1;
– The Land Code of RF d/d 25.10.2001 № 136 – F.L.;
– The Water Code d/d 3.06.2006 г. № 74 – F.L.;
– The Forestry Code d/d 4.12.2006 г. № 200 – F.L. and other.

They have essentially changed a social and economic situation in the country that demands revision of functions and system of administrating authorities of environment, government perfection in this area.

The government means state policy realization through system of authorities (government authorities) at which state-imperious powers are delegated top-down.

The state government in the field of conservation of the environment is a part of social management, and this is considered as one of functions of the Russian Federation. Environmental management and management of conservation of the environment exist to provide realization of the environmental law. Both public value of the right as a whole and the rights of citizens for favorable environment is shown, first of all, in the process of realisation of corresponding instruction in law.

Chapter II of Federal Law "Concerning the Protection of the Environment" is devoted to bases of management in the field of environmental preservation. The law-maker allocates empowerment: for government authorities of the Russian Federation, government authorities of subjects of the Russian Federation in sphere of the relations connected with conservation of the environment, and also bases of management in the field of the conservation of the environment that carry out by local governments. However, not all legal instructions now that register in standard legal certificates are executed properly.

Environment-oriented relations and the relations connected with management of natural resources are regulated now by variety of laws frequently contradicting each other. Besides, in our country the complex system of the state ecological monitoring till now isn't created.

Environment and natural resources are a basis for the further social and economic development of the country and its separate regions, a guarantee of normal ability to live of the present and the future generations. But its condition in some industrial regions of Russia, such as Ural, Volga region and others, causes concern. Available reserves of natural resources, such as bowels, woods, waters, are used insufficiently effectively. Interests of the nation as the owner of natural resources are often protected not to the full, and for users of natural resources accurate conditions and stimulus to their effective use aren't defined. The system of environment-oriented regulation in Russia doesn't meet the requirements that shown to such systems in the countries with the developed market economy, and loses to them under many factors.

The normative legal base of regulation of conservation of the environment and environmental management is characterized by following basic lacks:

1. Absence of accurate differentiation of empowerment of the Russian Federation and its subjects in environmental management and conservation of the environment sphere;

2. Irregularity of system of penalties and payments in case environmental contamination, and other economic and financial tools of environmental management;

3. Absence of full coordination between the institution which are carrying out control in sphere of environmental management and preservation of the environment;

4. Irregularity of system of information support of state regulation of environmental management;

5. Absence of necessary legal fastening of forms of participation of public organizations, and also citizens in control over use, reproduction and protection of natural resources.

6. Necessity of reforming of the ecological legislation for government system is caused by radical changes of economic system of Russia, democratic transformations of the state and public life. Declaration of the Russian Federation as a lawful state, supremacy of law, the concept of separation of powers assumes serious legal changes in government system, including the field of environmental protection, maintenance of favorable natural conditions of residing of citizens.

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CLIMATE CHANGE: THE PROBLEM AND THE WAYS OUT

Micheal Ebule
Sumy State University, Sumy, Ukraine

Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. It may be a change in average weather conditions or the distribution of events around that average. The term "climate change" has become synonymous with anthropogenic global warming. Within scientific journals, global warming refers to surface temperature increases while climate change includes global warming and everything else that increasing greenhouse gas levels will affect.

Many factors are contributing to climate change, from fossil fuel use to the burning and clearing of tropical forests. We need a comprehensive approach to reduce the impacts of climate change - an approach that decreases emissions across all sectors and enhances the adaptive capacity of all nations. Reducing greenhouse gas (GHG) emissions and stabilizing atmospheric concentrations at 350-450 parts per million CO_2 equivalent (ppm CO_2e) is essential. The current GHG level is approximately 390 ppm CO_2e. Solutions are needed now. In addition, human communities need the knowledge and tools to effectively adapt to the impacts of climate change.

A greenhouse gas (sometimes abbreviated GHG) is a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The greenhouse effect is a process by which thermal radiation from a planetary surface is absorbed by atmospheric greenhouse gases, and is re-radiated in all directions.

Life on earth depends on energy from the sun. Nearly 30 percent of the sunlight that beams toward Earth is deflected by the outer atmosphere and scattered back into space. The rest reaches the planet's surface and is reflected upward again as a type of slow-moving energy called infrared radiation.

The heat caused by infrared radiation is absorbed by "greenhouse gases" such as water vapor, carbon dioxide, ozone and methane, which slows its escape from the atmosphere. Although greenhouse gases make up only about 1 percent of the Earth's atmosphere, they regulate our climate by trapping heat and holding it in a kind of warm-air blanket that surrounds the planet.

Levels of several important greenhouse gases have increased by about 40% since large-scale industrialization began around 150 years ago. During the past 20 years, about three-quarters of human-caused (anthropogenic) emissions came from burning fossil fuels. Concentrations of carbon dioxide in the atmosphere are naturally regulated by numerous processes collectively known as the "carbon cycle". The flux, or movement, of carbon between the atmosphere and Earth's land and oceans is dominated by natural processes, including plant photosynthesis.

While these natural processes can absorb some of the net 6.2 billion metric tons (7.2 billion metric tons less 1 billion metric tons of sinks) of anthropogenic carbon dioxide emissions produced each year (measured in carbon equivalent terms), an estimated 4.1 billion metric tons are added to the atmosphere each year. This positive imbalance between greenhouse gas emissions and absorption results in the continuing increase in atmospheric concentrations of greenhouse gases.

To make countries to decrease their greenhouse gas emissions the Kyoto Protocol was adopted. The Kyoto Protocol took two initial steps toward the creation of a viable international emission permit trading scheme. These were:

• The definition of an overall cap for emissions in Parties, and the timeframe over which the cap will operate; thereby defining an environmental objective;

• The division of the cap into country targets, which amounts to the initial allocation of emission quotas among Parties.

Greenhouse gases can be removed from the atmosphere by various processes, as a consequence of:

- a physical change (condensation and precipitation remove water vapor from the atmosphere).
- a chemical reaction within the atmosphere. For example, methane is oxidized by reaction with naturally occurring hydroxyl radical, OH• and degraded to CO_2 and water vapor (CO_2 from the oxidation of methane is not included in the methane Global warming potential). Other chemical reactions include solution and solid phase chemistry occurring in atmospheric aerosols.
- a physical exchange between the atmosphere and the other compartments of the planet. An example is the mixing of atmospheric gases into the oceans.
- a chemical change at the interface between the atmosphere and the other compartments of the planet. This is the case for CO_2, which is reduced by photosynthesis of plants, and which, after dissolving in the oceans, reacts to form carbonic acid and bicarbonate and carbonate ions (see ocean acidification).
- a photochemical change. Halocarbons are dissociated by UV light releasing Cl• and F• as free radicals in the stratosphere with harmful effects on ozone (halocarbons are generally too stable to disappear by chemical reaction in the atmosphere).

To lessen those long-term effects from the climate change, many nations, communities and individuals are taking actions now to reduce greenhouse gas emissions and slow global warming by reducing dependence on fossil fuels, increasing the use of renewable energy, expanding forests, and making lifestyle choices that help to sustain the environment.

Supervisor: Nadiya Kostyuchenko

DEFORESTATION AND POVERTY IN THE RURAL ZONE OF CAMEROON

Eric Etongwe
Sumy State University, Sumy, Ukraine

Whereas forests play a very important role in the genesis and maintenance of the production potential of soils and watershed protection, harbour large proportions of the world is plant and animal species, serve as a reservoir of resources in the form of food, medicinal plants and wood. Over one half of the world is living species are found in tropical forests that only occupy seven percent of the total land surface. Unfortunately, most of these species are not found in any other type of ecosystem. It has been estimated that 25 percent of the species which existed in the mid-1980s may be extinct by 2015. If tropical forest conversion continues unabated, the world may lose between 5 and 15% of its total plant and animal species between 1990 and 2020. More than three quarters of the world's population depend directly on plants for medicines, many of which are extracted from tropical forests.

In Cameroon, the supply of fuel wood from forests accounts for over 60% of the energy consumed and has been increasing at a rate of 2.5% per year since 1974-1976. The forestry sector occupies the first place in export tonnage and third place in foreign earnings. It accounts for about 4% of the Gross Domestic Product (GDP) and offer about 40,000 jobs . Cameroonian forests contain an estimated 300 different tree species and the country can be said to have a forest based-economy. With her potential, Cameroon is at the second position amongst forestry African countries after the Democratic Republic of Congo. Furthermore, forests serve as a habitat for primitive populations. They live in and near tropical forests and are for the most part very poor. It is then clear that the immediate survival of these people is threatened and their poverty trend is aggravated when and where forests are damaged through inappropriate development. The survival and sustainability of forests is crucial and perhaps obligatory for the interests of both the present and future generations of pygmy. Cameroon has some of the greatest biodiversity in Africa, and also has the highest percentage of logged forest of any African nation with substantial rain forest. In addition, Cameroon is one of the Sudano-Sahelian countries in Africa that show signs of some desertification. The northern part of the country was previously under forest, and due to the extreme degradation of vegetative cover, it's now under savannah grasslands. It appears therefore that deforestation in Cameroon should be the preoccupation of environmental and human resource economists, ecologists as well as policy makers because of its threat to ecological sustainability and socio-economic development in the long run.

The causes of deforestation have been attributed to several factors. The most important categories are the immediate and the underlying causes. In Sudan, Stryker et al (1989) found that increased producer prices of export crops encouraged woodland clearing for crop cultivation and this resulted in significant deforestation. Based on the market theoretical approach, Angelsen. Et al (1999) statistical analysis in Tanzania

showed that the increase of agricultural output prices, in particular annual crops is a major factor behind deforestation. The results of these authors were confirmed in Ivory Coast where the effects of price increase of export goods contributed to deforestation but to a lesser extent than the lack of a consistent and secure land tenure system. Osei Asare and Obeng Asiedu (2000) found in Ghana a long-run equilibrium relationship between the producer prices of cocoa and coffee, fertiliser prices, food crop prices, agricultural wages, timber prices and agricultural credit on the one hand and deforestation on the other hand. In this country, higher levels of fertiliser prices, food crop prices and coffee producer prices stimulate in the long-run higher levels of deforestation whereas higher levels of agricultural wages precipitates lower levels of deforestation.

Although Cameroon is the central African country that has attracted most attention from researchers and environmentalists, very few econometric studies on the causes of deforestation are available. Ndoye and Kaimowitz (2000) look at the influence of macroeconomic and agricultural policies, market fluctuations and demographic changes on the humid forest zone of Cameroon between 1967 and 1997. To capture deforestation, they use increases in perennial crop area and in the combined area of annual crops. The results indicate that cocoa, coffee and food production have a strong impact on forests and that pressure on forest areas increased after the oil boom, the Structural Adjustment Program (S.A.P) and the devaluation of the CFA franc in 1994.

However, one aspect often overlooked is the environmental consequences of misguided government policies on deforestation. The effects of such policies are often indirect and unintended. With respect to social and economic costs of forest destruction, it is fundamental for tropical forestry countries to establish policies that counteract the opportunities of deforestation in situations where forest clearing is inappropriate. These policies have as goal, to make forest conversion less profitable, or other alternatives (either based on retaining forests or completely outside forest areas) be made more profitable. They can be grouped into six categories. Deforestation can be made less profitable by: Reducing the demand or prices for products produced from newly cleared land; Increasing the unit costs and riskiness of activities associated with deforestation; Eliminating speculative gains in land markets. Alternatives to deforestation can be made more profitable by: Increasing the income stream to be obtained from maintaining forests; Reducing the costs of maintaining forests; Increasing the opportunity costs of labor and capital that might otherwise be used in activities associated with deforestation.

The effects of deforestation in Cameroon such as the erosion of agricultural lands, drying up water bodies during dry seasons, desertification, disappearance of plant and animal species, modifications of both local and regional climatic conditions and global warming through its effect on the global carbon cycle are likely to affect agricultural activities and economic growth and therefore aggravate poverty in the rural zone.

Supervisor: Nataliya Vernydud

INFORMATIONAL ECONOMICS AS A PHENOMENON AND PART OF POST-INDUSTRIAL SOCIETY

Alexander Garkavenko
Ivan Franko National University of L'viv, Ukraine

Informational economics is the most important and characteristic feature of post-industrial society. According to researching of World Bank, that was conducted in North America, three quarters of national wealth is formed in consequence of investment in human "live" capital. Human capital is directed to education, scientific research, healthcare, environmental protection and the development of human personality.

Informational economics is economics of symbols and signs. The most important features of this economics is that knowledge and information become main economic and productive resource; and that this economics functions on the basis of relations of intellectual property. Human capital (knowledge and information) becomes a substitute of money capital.

Work in "on-line" conditions is one of determinative features of informational ultrafast symbolic economy – knowledge-based economics. This work is not realized directly by the market, but by the informational network systems. Knowledge-based economics realize its creative potential by the global electronic environment – networked economics. Economic specificity of informational networks connected with activity of law of saving working time.

New aspects in characteristic of knowledge-based economics is determined by principled changes in the character of labor and creative activity. Human is generator and carrier of information. Human as knowledge worker is the main subject of knowledge-based economics. Knowledge workers own means of production which is their knowledge.

The main product of creative activity is not only set of material and spiritual values, but also creative personality. In post-industrial society creative activity is reproduction of creative potential of personality.

In post-industrial society immaterial labor becomes the dominant value in knowledge-based economics. The result immaterial labor is not only creation of material values, but also creation of social product – entire gamut of relationships among of people.

PROBLEMS OF ECOSYSTEM SERVICES MARKETS DEVELOPMENT

Tatyana Gorobchenko
Sumy State University, Sumy, Ukraine

Currently, the interest in ecosystem services is growing steadily, as humanity begins to realize that a natural ecosystem functioning is more profitable than the resources extraction. Ecosystems are the source of many services that are invaluable for the proper environment functioning, economic and social development. Therefore, to preserve and sub-holding of ecosystem services it is necessary to form countervailing market mechanisms.

Market of ecosystem services, in a broad sense, should be understood as a set of individuals and organizations that purchase and supply ecosystem services. Market mechanism for ecosystem services, in fact, is the source of financing their reproduction, and is engaged in conservation and enhancement of biodiversity. In market conditions ecoservices take the form of goods, so buyers and sellers are transformed into "taxpayers" and "recipients". Not all ecosystem services can have a market of buyers and sellers. This may be due to either the "market failure", i.e. lack of markets for public goods, or the internalization of external effects of human economical activity. There are some types of markets can be found as part of payments system for ecosystem services (Fig. 1) [1].

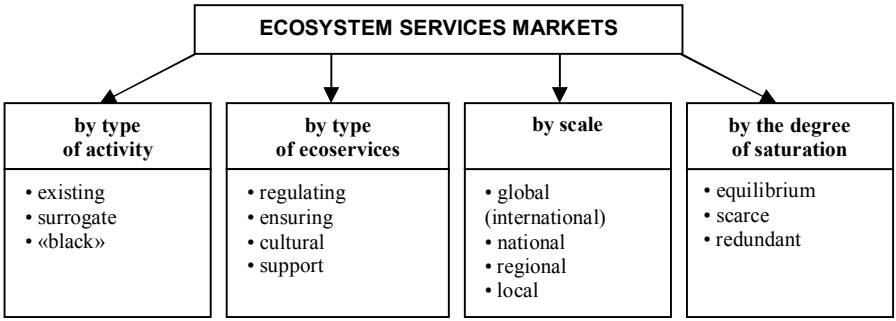

Figure 1. Classification for ecosystem services markets

International markets for ecosystem services are characterized with exponential growth in. The most dynamic market segments are following [2]:

market of genetic resources (strains of microorganisms, medicinal raw materials of vegetable and animal breeding, materials) as well as equitable distribution of benefits for their use;

market of quotas for carbon emissions, which basics are lay down under the Kyoto Protocol;

market for "natural debt" (re-enterprising harmful to natural objects users; restructuring of public debt for some countries in exchange to intensify measures for the preservation of the environment).

Among the above mentioned segments the global market for greenhouse gas emissions got a particular relevance in recent years. It ensures the formation of a payment system for regulatory ecosystem services. Use of this market mechanism can help not only to reduce emissions, while obtaining economic benefits, but also increase the use of high-clean technologies. The United Nations Environment Programme (UNEP) suggests that the total world market of emission quotas of greenhouse gas emissions, restoration of water resources and other ecosystem services in 2020 will exceed 60 billion U.S. dollars. There is still open number of outstanding issues related to pricing of greenhouse gas emissions, calculating the volume of emissions, redistribution and consolidation among individual subject, monitoring the implementation of agreements concluded for the sale of emissions, etc.

The market mechanism for ecosystem services designed for effective distribution of natural goods and services, as well as for economic benefits and protection of the environment. Creating markets for ecosystem services payments shows an innovating approach to the redistribution of financial flows in favor of organizations and individuals that preserve and restore biodiversity. Unfortunately, the undeveloped methodological framework of economic valuation of ecosystem services, weak institutional infrastructure, inadequate legal and regulatory framework to natural payments cause underestimation of the current economic value of ecosystems, "uncompetitive" conservation of biodiversity. To generate economically viable prices for ecoservices and use them to restore and maintain a balance between nature and society considered issues must be researched and solved.

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ENVIRONMENTAL MANAGEMENT OF UNIVERSITIES

Thomas S. Grindsted
Roskilde University, Department of Environmental, Social and Spatial Change, Denmark

The principal aim of this thesis is to investigate the role of universities in the development of a sustainable society. In order to combat climate change, ecosystem degradation and resource depletion radical rethinking of society's consumption and production processes is needed. The current environmental problems grow faster than society's ability to find and implement sustainable solutions.

Figure 1. The Earth as conceived by science – the human-nature relationship and scientific reflection

Therefore society needs to be reorganized in such a way that environmental performance becomes an integrated part of the system[1]. According to environmental research carried through during the past 30 years there is strong

[1]For instance the level of greenhouse gasses we emit into the atmosphere continues to grow. The latest UNEP Emission Gap Report finds :*" that emission levels of approximately 44 gigatonnes of carbon dioxide equivalent (GtCO2e) (range: 39-44 GtCO2e*) in 2020 would be consistent with a "likely" chance of limiting global warming to 2° C.– Under business-as-usual projections, global emissions could reach 56 GtCO2e (range: 54-60 GtCO2e) in 2020, leaving a gap of 12 GtCO2e.* (UNEP 2010:4).

evidence of climate change. However, although progress has already been made, no university can be said to be sustainable, since in general neither study programs nor the level of maintenance of universities correspond to the efforts needed to be done according to climate research. In the thesis it is analyzed how the concept of sustainable universities has developed internationally. This is done through the analysis of declarations on sustainability in higher education, green campus alliances, monitory tools and audit schemes. The study of the international development within the field of sustainable universities is related to a Danish context in which technical, political, economic and organizational dynamics and rationalities that shape planning and plan solutions in practice are emphasized. The thesis analyzes strategies on how to bridge the gap between sustainability and "the production of nature" in research and study programs and maintenance of the campus in order to develop a comprehensive strategy of green campus areas.

The methodological approach is based on athematic analysis, dialectical materialism and critical realism.

Keywords: Sustainable University, Sustainability in Higher Education Declarations, Green Campus Alliance, Sustainability efforts at Danish Universities, Postmodern Ecological Ideals of Science, Sustainable Research

MAIN PROBLEMS OF THE BALTIC REGION

Maksim Gurba
Saint PetersburgStateUniversity of Mineral resources (Mining), Russia

The struggle against petroleum pollution:

About 20 years ago, more precisely in 1987, less than 20 million tons of petroleum products passed through all Russian ports on the Gulf of Finland; in 2001 this figure was already 50 million tons, in 2003 – 77 million tons per year. According to one of the schemes for development of the port of Primorsk in the Leningrad Region, they envisage the possibility of bringing this capacity up to 110 million tons of petroleum and petroleum products per year. With the inevitable increase of the volume of maritime transport, the government of St. Petersburg and the government of the Leningrad Region would have to pay more attention to the safety of maritime transportation corridors in the Baltic Sea. For this purpose, satellite monitoring of the maritime and coastal environment was arranged in the Russian zone of the Baltic Sea. At the 5th international forum «Day of the Baltic Sea», held in Petersburg, among other important subjects, a round-table session was organized on «Ways to guarantee the safety of the transport of petroleum products in the Baltic Sea». Its participants, representatives of various sectors of society, noted that «the growth in the number of arrivals of vessels of the tanker fleet» increases the risk of vessel disasters and the accidental spills of petroleum products, especially in conditions of drifting ice. At that time, a recommendation

was adopted at the forum for administrative structures and commercial organizations connected with the transport of ecologically dangerous cargoes in the waters of the Baltic Sea. The substance of the recommendation was the need to immediately develop the system of monitoring the environmental condition of the sea, including the satellite monitoring of port complexes, the coastal zones adjacent to them, and shipping routes.

Russia's transport activity in Baltic waters also alarms the European Union. In April 2004 the International Maritime Organization adopted a decision to give the Baltic Sea the status of a «Particularly Sensitive Sea Area». In these conditions, the activity of the third sector -- which independently monitors compliance with environmental law in the construction and functioning of structures of the petroleum, petroleum refining, and «petroleum transportation» branches, as well as the entire spectrum of the national economy that works with hydrocarbon fuel -- is not only appropriate, but also extraordinarily important for the country, in spite of a multitude of directly contradictory assessments of this activity on the part of very authoritative people, including the Russian president, Vladimir Putin. The activism of environmental NGOs in this field is varied, but always subject to sharp criticism. Many NGOs work on different aspects of this problem: Bellona, WWF, IA Sustainable Development, Green World, Eco-Defence. There are also ecological activists who work alone, for example, AleksandrSutyagin, the superior expert in this field.

Nuclear security:

In our region, lying on the Baltic Sea, the aging reactors of the Leningrad Atomic Station represent the most serious problem. The blocks installed in SosnovyBor were named «Chernobylski» by the people. In fact these are RBMK-1000 reactors, like those at the Chernobyl Atomic Station. And although enormous sums of (mostly Western) money have been invested in systems to upgrade their safety, the moral and physical aging of the blocks, in combination with the loss of faith that there is any truth in the information about what happens at the station, makes LAES (Leningrad Atomic Energy Station) an ecologically dangerous structure, in the opinion of the residents of the metropolis. In November 2005 the regional government listened to proposals on replacing the LAES, which was coming to the end of its working life, calling their meeting something more concrete – the Northwest AES. However, as before, the public knows very little about the new project. Another pain suffered by the Northwest, also located in SosnoviiBor – 60 kilometres from Petersburg – is the Radon special combine, where radioactive wastes are stored. Its capacity is practically exhausted. And the development of the atomic branch in the region is under a large question mark, at least for this one reason. Both structures, and also the Ekomet-S plant in SosnoviiBor, built in violation of the requirements of environmental preservation law, is in the zone which is permanently watched by Petersburg's environmentalist NGOs: Bellona, Greenpeace, Green World, and the Association of Environmental Journalists of St. Petersburg keep track of what happens in Sosnovii Bor.

MODERN SOCIO-ECONOMIC METHODS TOWARD INDIVIDUALS' PERCEPTIONS REGARDING THE ENVIRONMENT

Layla M. Hamad
Kharkov National University of Radioelectonic

In the transitive economics conditions the most significant role have such decisions that have an evident influence on quality of the environment, because the market prices do not reflect real values and originality of natural resources. Decisions concerning their management play a very important role, because natural systems are inert, their influence on the environment is significant and public preferences often stay unrevealed because of the absence of market of nature systems' services.

For the well-grounded decision making it is necessary to use value assessment. Methods that can help to determine an economic value of natural resources do not take into consideration all elements of economic value or they have another essential methodology disadvantages. There is no universal method for determining the total economic value.

Methods of revealed preferences evaluate use value and do not take into consideration existence value. Methods of stated preferences embrace existence value, but they have restriction concerning adequacy and interpretation of the results.These methods are widely used and effective as well. But they do not pay enough attention to the individuals' behaviour features and to the subjectivity of their responses to certain questions. In the contrary, Q-method, which was was invented in 1935 by British physicist-psychologist William Stephenson (1953). Q-method combines the strength of both qualitative and quantitative research methods.

Q-method is often associated with quantitative analysis due to its involvement with factor analysis. Stephenson was interested in providing was a way to reveal the subjectivity involved in any situation. Q methodology allows researchers to examine the subjective perceptions of individuals on any number of topics. It also helps to identify commonalities and differences in subjective perceptions across a sample group.

Q methodology is a research technique that allows a researcher to

1) identify, understand, and categorize individual perceptions and opinions, and

2) cluster groups based on their perceptions. The real utility of Q methodology lies in uncovering these opinion/perception clusters. Once identified, they can be targeted for follow-up activities such as further research or programmatic activities. It is the combination of qualitative and quantitative research techniques that allows researchers to identify individuals who share common opinions. Q methodology is often used for the following:

- identifying important internal and external constituencies
- defining participant viewpoints and perceptions
- providing sharper insight into preferred management directions
- identifying criteria that are important to clusters of individuals
- examining areas of friction, consensus, and conflict
- isolating gaps in shared understanding

The qualitative aspect of Q methodology is grounded in its ability to emphasize the how and why people think the way they do. The primary goal is to uncover different patterns of thought—not to count how many people think the way they do. The quantitative aspect involves using factor analytic techniques (specifically, principle components analysis [PCA]) as a means for grouping like-minded individuals. Q-methodology uncovers and identifies the range of opinions regarding a specific topic under investigation. The methodology involves three stages:

1) Developing a set of statements to be sorted;
2) Participants are to sort the statements along a continuum of preference;
3) Analysys the data are and its interpret.

Q methodology, like many research methods, can be used to observe perceptions from the context of an individual or from the context of a group of individuals. In Q methodology, intrasubjective studies gather data from an individual on multiple issues of interest. The individual‘s opinions are then clustered based on similarity of opinion. The purpose is to determine whether the various opinions of the individual give rise to a greater thematic understanding of the issues at hand. Typically, an individual may be asked to reveal his/her perceptions on a variety of different constructs. When examined in total, the findings may reveal similarity patterns. For example, a programmer may be studied to determine his/her preferences for different software programming methodologies under various conditions. In this case, the study is intrasubjective because the researcher is studying a single individual to determine if preferences cluster around one or more common themes.

Conversely, intersubjective studies focus on how perceptions of groups of people cluster on one issue or more. The issue may be single or multidimensional.

The point being, if one was only concerned about how various traits clustered together, they would be employing traditional factor analysis methods. Alternatively, Q methodology is concerned with clustering like-minded perceptions. It is a means for identifying the presence of patterns of opinions. Whether it is single dimensional or multidimensional, the study is always framed around finding patterns of subjective perceptions

THE PROBLEMS OF ENVIRONMENTAL PROGRAMS AND PROJECTS FINANCING UNDER THE PUBLIC PRIVATE PARTNERSHIP

Larysa Hrytsenko
State Higher Educational Institution «Ukrainian Academy of Banking of the National bank of Ukraine», Sumy, Ukraine

Public Private Partnership (PPP) is an effective tool of country social and economic development. It's also an efficient method of fundraising for financing important social projects in conditions of a significant budget funds shortage and necessity of establishing the long-term relations with potential investors. The productive cooperation of business and government in PPP projects creates positive condition for the business entities operation, development of strategically important branches of country economy, regional development, cities recovery, research and development projects financing, innovative products and advanced technologies implementation, achievement of better technical and economic performance indicators, reducing of budget expenses for the infrastructure development financing etc.

But there are still a lot of problems on the way of PPP implementation in Ukraine, among them: unstable macroeconomic situation; imperfect legislative base for the establishment and effective PPP functioning; regulatory and legal restrictions of the PPP projects realizing; lack of sufficient motivation factors for attracting an investment capital for the PPP projects financing; undeveloped infrastructure that hinders an effective PPP realization; absence of the transparent PPP implementation and realization mechanism; lack of qualified personnel in the sphere of infrastructure facilities management and their development forecasting; lack of the private and public institutions support in the PPP organization; lack of practical knowledge among specialists, who engaged in the development, expert evaluation and implementation of the large investment projects; lack of regulatory defined rights and obligations of all PPP participants; lack of regulatory defined system of the assessment procedures for the selection and realization of the PPP projects; significant risk concentration and inefficient risk diversification; imperfect monitoring and evaluation mechanism of the PPP projects both for the government and private partners; ineffective PPP members functions placement; weak integration of the domestic economy into the world economic system etc.

Programs and PPP projects should be oriented on the social and economic development insurance, the increase of the competitiveness level of different administrative entities of the country and industrial efficiency, the extension of the infrastructure facilities economic potential etc. Within this it's necessary to focus on development and realization of different types of real investment programs and projects in industrial, social, environmental and scientific spheres.

Ecological projects provide development and implementation environmental technologies, realization different environmental measures such as using of new air and water cleaning methods and advanced technologies, implementation of innovative methods of environmental performance of the manufacturing process improvement, creating innovative eco-friendly products etc.

There are some specific features of ecological projects such as environmentally friendly character and using of innovative tools (technics, technology, products) to ensure high level of ecological responsibility.

Nowadays the problem of realization PPP ecological program and projects is very important and urgent one. Moreover there are a lot of unsolved problems connected with PPP concept development and implementation in Ukraine, audit and assessment of PPP projects financing efficiency.

In our opinion, the main task of forming PPP project assessment system is to find out and justify commercial and strategic importance of PPP project (as combination of building, technological, financial and managerial decisions) for state and regional social and economic development in accordance with modern investment development tendencies, possibilities of gaining positive economic, social and ecological effects for separate region of the whole country.

Forming of PPP project assessment system is the main direction of PPP concept implementation in Ukraine. Theoretical base of this system should include main principles and methodological facets of realization and assessment PPP projects. Special attention should be paid to PPP project risk-management, specific features of drafting a feasibility study of PPP investment projects and its classification, and methodology of financing project assessment.

Using of such procedures will ensure the identification of PPP project, including ecological projects, importance and development of state support financing and realization mechanism. So solving of the ecological projects financing problems will be possible in conditions of state interference in the process of development the PPP improvement mechanism, overcoming major obstacles that hinder the development of PPP, attracting of investors and banking institutions to effective cooperation.

PROBLEMS OF ENVIRONMENTAL ORGANIZATIONS INFORMATION SUPPORT

Mykola Humennyy, Maxim Novikov
Sumy State University, Sumy, Ukraine

It is necessary to have resources to doing any activity. Information resources have one of the priority ratings. Environmental activity also requires a sufficient number of quality information.

With goals to observe, identify and analyze environmental problems, environmental organizations have the next examples of information packets:

- Environmental status of the chosen site and adjacent areas.
- Factors of environment influence, their level and time characteristics.
- Possible ways to reduce harmful effects and enhance the efficiency of various ecological factors.
- The reaction of the environment on these or other actions to change the status of natural factors.
- And others.

The whole complex process of information's creating, encoding, transmission, receiving, decoding, editing, analyzing and the necessary instruments, appliances, equipment and skills can be defined in a single definition - information system.

Provision of information systems of environmental management is an important state task. One of the most important issues is the problem of the necessary information providing to officers who make management decisions. An increasing in information provision is an important factor of management efficiency achieving. Another problem is the difficult access to environmental information to the public and stakeholders. But the main problem is lack of attention to these questions and small number of steps to make a difference.

To solve outlined problems, we think, it is necessary to take the following steps:

1) Recognition of this problem by the executive authorities, local governments, concerned organizations and nongovernment subjects.

2) Setting up the communication process between all participants of this process.

3) Meeting to develop a joint action plan by all stakeholders, finding out of the situation and attract a wide range of public and media in this process.

4) Regularly informing the general public about the plan implementation through public media and community channels (press, TV, web).

Unfortunately in society today there is no understanding of information support of environmental issues. And time is playing against us. Only a radical and urgent change of society and the state attitude to information providing of these problems will bring us closer to sustainable development.

THE ROLE OF STUDENTS TO IMPROVE INDEPENDENT VILLAGE WITH ENVIRONMENTAL ASPECTS BY POSDAYA PROGRAM

Alfi Irfan
Bogor Agricultural University, Indonesia

Indonesia is a country that has many natural resources. This potential is scattered in all directions. Structure of climate, soil, and geography make Indonesia has so many advantages in tropical food commodities, oil palm plantations, as well as other commodities. The beach is reached by 81,000 km shows that this country is the third longest coastline in the world, also 2/3 area of Indonesia is covered by sea makes this potential is extraordinary when it can be managed well. Indonesia consist of 18,108 islands , but only 6,000 islands with settlement. Natural resources of the sea, combined with tropical rain forests makes Indonesia has a very high diversity of biodiversity with more than 350 types of fauna, 28,000 species of flora, and more than 600 types of coral reefs (not including fish, shrimp, mollusks, pearls, crabs, sea grass , magrove, other reef animals).

Potential of Indonesia has not been optimized properly. There are some things that inhibit the utilization of natural resources of Indonesia, the most important is the quality of human resource problems and limitations of technology for efficiency and productivity. This problem is common in developing countries. Government have a dilemma, and also trade off the effects of each policy are made.

Figure 1. Some of empowerment prjgram achievements in field of pririties

The Government is obliged to take care of the state in economic, ecological, and environmental. A more noble to do is the equity movement from public to the

public. This motion requires a good human resources that advance the scientific and villages based on the uniformity of values. This role has been done by students in order to contribute to advancing the state through community service program. Bogor Agricultural University is one of the pioneers of community service programs on the basis of students as a promotor. The program is packaged in a curriculum that is academic and non-academic aspects. Academic community empowerment activities through a program called college work profession for 6th semester students. Students were given approximately two months to serve the communities according to their core competence. Students are released directly to all corners of the groups. Ranging from rural to urban areas. The release was immediately opened by the rector. Other programs aimed at community development is a scholarship for a companion program called Posdaya. Posdaya is the forum for a relationship, communication, advocacy and container activities strengthening family functions in an integrated manner.

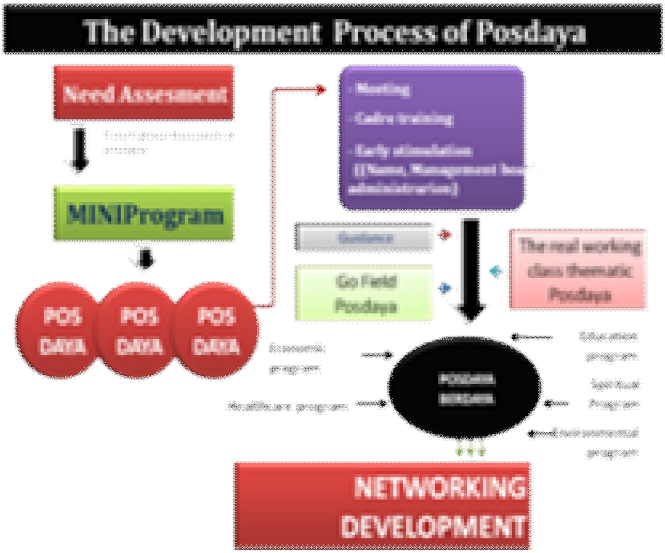


Figure 2. The Development of Posdaya

Posdaya not role as a competitor / replace existing activities, but to establish communication and build a container of community with togetherness. The students work as a companion posdaya include forming a work program if the location does not exist yet, turn back if there is ever a program, improving the quality program if the program already exists, synergize all community development programs, building opportunities for cooperation with external stakeholders to the community empowerment.

ECOTAX LABOR REFORM AS THE BASIS OF A GREEN ECONOMY

Julia Ivanchikova
National University Kyiv-Mohyla Academy, Ukraine

Eco-tax labor reform is the basis of a green economy.

From the perspective of a green economy, economic activity of mankind is seen as the creation and consumption of wealth in the process of converting matter to energy use, in which both matter and energy are taken out from the environment. It is not sufficient to take in account market demand for determine the real value of any product. The price of the goods or services in this approach should include the costs of the biosphere but not only the costs directly incurred by the person at their production and consumption. Cost for the whole system is the cost of energy and material resources what were spent on its production, including their deficit not only for humans but also for the biosphere, and the cost of using environment: the disposal of waste from its manufacturing and consumption, and to restore the resources used.

The main idea eco-economy is the concept of "natural capital".

"Natural capital" here is used as the fund that produces a stream of natural resources and services. The components of natural capital are deposits of minerals, natural populations of industrial plants and animals, freshwater pools that offer water, fertile soils and restoration of soil fertility, photosynthesis and oxygen regeneration, circulation of substances in nature, self-cleaning air and water, waste absorption, recreation services and other. Thus, income that comes from natural capital includes natural products and environmental services. The most important thing for understanding is the fact that man-made or fiscal capital cannot replace natural capital. Against the classical market economy that provides for the replacement of natural capital equivalent to the cost of artificial capital, environmental economics considers natural and human capital only partially commute and, in most cases - complementary and indispensable.

In EU countries have found a logical way of development to the concept of "eco-tax reform". These countries have reformed their taxation systems long ago. The essence of theirs reforms is simple and obvious for everybody. It means the transfer of tax burden from labor and capital on the resource feed.

One of the greatest advantages of eco-tax reform is a double dividend.

Taxation is a strong incentive to reduce an inefficient use of natural resources, will promote less intensive technologies, implementation of energy efficiency measures, pollution prevention and others improve points. In addition, physically healthy nation works more efficient.

Tax system of Ukraine is still based on outdated approaches. Four main taxes - tax on personal income, tax on company profit, value added and excise tax – makes up over 80% of revenues to consolidated budget.

However, the share of "environmental" taxes in total tax revenue in Ukraine is only 3-4%. 90% of this number is the royalties mining companies in mining of mineral resources. Actually, the "green" tax that was paying for pollution, including fines, charges and energy charges for the using of non-renewable resources, were in different years, only 0.3-0.5% of the revenues of the consolidated budget.

Assessment resources should rise gradually each year for 10 years, but all marginal tax rates should be announced in advance. So businesses will get enough time to adapt to new conditions, with a warning about future cost increases. With increasing of “eco-tax” every year rates of deductions from payroll and citizen’s income must be decreasing.

Another mechanism of implement of the new tax is the returning the part of "eco-tax" in the energy-saving technologies.

Ways of solving the problem were proposed.

At first, increase rates of carbon tax with the useful mechanism in some stages.

As the second, raise the tax rate and emission rate of tax on waste disposal. Similarly, as the carbon tax, these raised taxes may be about 5 times higher than set out in the Codex now and provide further annual increasing of these rates by 50%. Only in that case these taxes will be a real incentive for the implementation of more cleanly ecological technologies and production.

Thirdly, the list of "eco" taxes must be put on consumption of water, electricity, and all fossil fuels. These taxes are applied on a progressive scale, and also increase annually over the next 10 years.

As the fourth, you must provide annual reduction of corporate profit tax, personal income and value added in proportion to the rise of "eco".

ENVIRONMENTAL AND ECONOMICAL ASSESSMENT BIOGAS PLANTS IN BELARUS

Vladimir Kapitsa, Aleh Kuchinski
International Sakharov Environmental University, Minsk, Belarus

Agricultural production is based on the use of natural resources that must be managed wisely. Environmental protection should be based on the exclusion of such methods and technologies that can lead to negative changes in the landscape.Conversion of animal waste to biogas through anaerobic digestion processes can provide added value to manure as an energy resource as fertilizer and reduce environmental problems associated with animal wastes.

From USSR times Belarus has a huge livestock farms (cattle up to 4000 and pigs up to 30 000 animals per farm) so we have a high negative environmental impact at the regions of their localisation. Nowadays Belarus has:

51 large cattle farms (total 200 000 heads);

69 huge pig plants (total 1,2 million heads)

17 large poultry factories and 48 poultry farms (total 21 million heads)

So, estimated amount of biogas production could reach 503.7 million cubic meters per year, equivalent to 433.2 thousand tons of fuel equivalent.

Existing in Belarus methods of biogas plant economic efficiency use only profits from the production of electricity and heat. In this case, our estimation of biogas plant in the poultry plant "Belorussky" (Minsk region) shows the return of consists up to 20 years at current energy prices.

Bad developed economical methods assessment of environmental effect from biogas plants implementations don't allows have profit assessment of environmental effects of biogas plants in Belarus.

We can distinguish the next effects from the use of biogas plants:

– increase the productivity of agricultural land;

– reducing the need for chemical fertilizers;

– reduces field infestation by weed's seeds, helminthes and other pathogens;

– reducing the pesticide need;

– reducing emissions of methane (greenhouse gas);

– desodoration of the territories;

– decrease water pollution

We can estimate only indirect benefits from the implementation of these environmental effects because absence of prices to a healthy environment and good methods of environmental and economic assessment in complex.

We tried to make an economic and environmental analysis of biogas complex activity in the Municipal Agricultural unitary Enterprise «Pedigree State Farm-Combine «Zapadny» (Brest region). We used only the resulting price of electricity from the combustion of biogas, the cost of sludge as the organo-mineral fertilizers. The results of the calculation suggest the feasibility of the use of biogas technology in the Republic of Belarus (return on investment is about 4-5 years). Additional benefits can be supplied for increasing of yield and reduction greenhouse gas emission, pesticide use, fuel saving from reduction of plant protection treatment.

THE SENSE OF BARRIERS TO ENTRY IN THE PROCESS OF SUSTAINABLE DEVELOPMENT ACHIEVEMENT

Aleksandra Karintseva, Anna Dyachenko

Sumy State University, Ukraine

Today the competition of indicators of environmental liability products and manufacturers is one of the leading areas of competition in the global market. The development of voluntary environmental certification systems, mechanisms to

establish and confirm the legality of forest products, the use of marine biological resources, establishing a list of requirements for the types of packaging that can be used in certain markets, the requirements for the recycling of packaging materials, the inclusion of indicators of environmental responsibility in the ratings of innovation appeal, raising the role of environmental factors in public procurement policies in the European Union - these processes are components of sustainable development policies of some developed countries. Other countries it considers as barriers to entry to the markets of these states.

Implementation of these and similar modern methods of management, including from the standpoint of environmental conservation in developing countries is impossible because of sufficient financial resources and economic experience.Sources of financial resources needed to implement technologies to preserve the environment can be either loans from international funds, or its own industry of environmental protection. Use the same highly advanced technologies while reducing pollution levels, but increase the overall intensity of resource exploitation. For example, technologies such as skidding base (fisheries), and chain saws (in forestry) have accelerated resource depletion and habitat destruction.

The environmental arguments in foreign economic relations of countries are a priority, when the differences in the level of development does not allow them to act in the agreements on equal positions. And it applys in main in the developed markets, where further growth is possible only through diversification of production and redistribution of shares of market participants.

In the modern world environmental barriers to entry are an important characteristic of the dynamics of the market for all subjects: entrenched firms, beginners, consumers, government anti-trust services. New firms do the analysis of high barriers to entry for making decisions about the most effective methods of entry. For consumers, the existence of significant barriers to entry indicates the limitation of their freedom to choose the quality and range of goods and services of dominant firms in the market. From the perspective of state barriers to entry use as support the protection of domestic markets and products from foreign competition, and for identifying tools to support and encourage competition in order to enhance sustainable development.

In the economic literature, there are two basic approaches to the definition of entry barriers: from the perspective of industrial organization theory and strategic management positions. The purpose of the first approach is to identify the barriers to entry and analysis of the industry in which such barriers exist. The second approach involves the assessment of the existence of barriers in terms of strategic decisions within the company's policy of strategic management.

Barriers can be caused by the objective characteristics of industries related to production technology, the nature of consumer preferences, the dynamics of demand, competition from foreign producers. Such barriers are non-strategic factors, market structure. Non-strategic barriers include economies of scale, absolute cost advantage, the specificity of assets, capital needs, excess capacity,

level of technology (technological gap), access to distribution networks, state licenses, control of strategic resources, the costs of research and experimental development, cultural diversity, density (compactness) of the product space, environmental taxes.

The second type of barriers - barriers caused by the strategic behavior of contractors operating in the market (including the state). These are: product differentiation, vertical integration, trade names, product and process patents, limited pricing, advertising, research and development; incompleteness and information asymmetry, investment risks, the costs of operating in foreign markets, requirements to the types of packaging that can be used to markets of various countries, the requirements for the recycling of packaging materials, eco-labeling.

Some of the barriers are desirable. For example, if the market creates positive externalities, and companies of that market are not sufficiently protected by barriers, the resources to carry out the work will be quickly exhausted. In such cases, entry into the market should be limited to the extent that the price of products and the level of technological innovation are in the optimal combination.

The presence in the behavior of market participants such as the features of bounded rationality forces to pay attention to the institutional forms of overcoming the barriers to entry, because the market is not always able to reconcile the interests of economic agents. Participants in market transactions should solve the problem of minimizing transaction costs, depending on the asset specificity, complexity of technology, frequency of transactions themselves, as being barriers to entry. That is, entry into the sector is complicated by the theoretical aspects of the game. Even in the simplest case of one firm and one newcomer it has the potential number of strategic interactions. And although the rules of the game after logging are exogenous, a firm can change entrenched in their own interests outcomes by changing the initial conditions. In particular, the irrevocable choice of investment allows it to change its marginal cost curve, after the entrance, and, consequently, arising after the entry for any given rule equilibrium.

That why barriers to entry, in particular environmental, as a tool to limit competition and maintain a certain level of profitability of the existing economic agents are an important issue in the study of the processes of sustainable development, because the range of possible barriers to entry into the market determines the conditions for entry into this segment of new firms and policy regulation of the market for goods and services, taking into account environmental requirements.

MODELING THE IMPACT OF POLLUTION ON THE SOCIAL COMPONENT OF ECONOMIC DEVELOPMENT

Ganna Kharlamova, Vladimir Nagornyj
Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

Humanity entered the third millennium with a burden of complex economic, political, ethnic, social and environmental problems. Namely environmental issues in its significance are unique in history. Thus, the objective prerequisites are created for the study and subsequent implementation of knowledge about different approaches to preserving the quality of the environment at local, regional and global levels.

The growing scale of economic activity results in its negative effects on nature, the threat of deterioration environment for human existence arises even for the normal functioning of the economy. The balance of natural processes is violated; the environment loses its ability for self-reproduction. In such situation the environmental assessment becomes necessary for a long existence of technological civilization, and the importance of modeling and forecasting ecological and economic processes becomes a burning issue.

In the practical part of the research, it has been examined the following statistics: emissions, energy consumption, water pollution, mortality, health expenditure, life expectancy, the prevalence of HIV, investment in fixed assets. The following groups of countries have been considered:

- Group 1 - Baltic countries (Lithuania, Latvia, Estonia);
- Group 2 - Ukraine, Russia.

Designations:

- AP - air pollution (CO_2 CT);
- EPC -electric power consumption (kWh per capita);
- EU - energy use (kg of fuel equivalent per person);
- WP - water pollution (kg per day per worker);
- DR - death rate (deaths per 1000 people);
- HE - health expenditure (% of GDP);
- LE - life expectancy (years);
- HIV - HIV prevalence (% of population aged 15-49 years);
- FI - fixed investment (% of GDP).

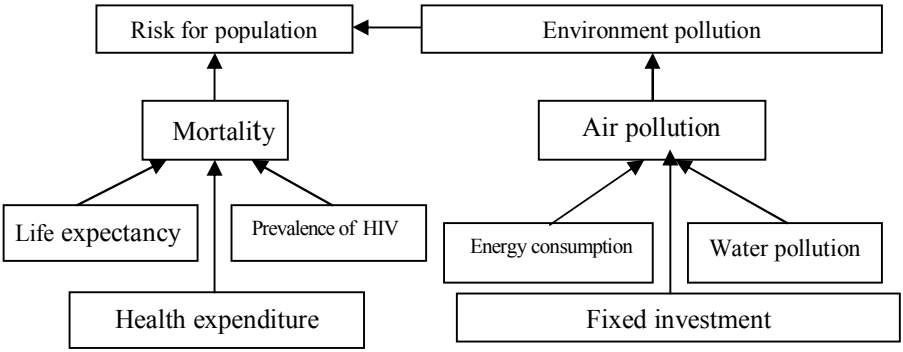
Links between these parameters are described by the next model:

$$\begin{cases} AP_{i,t} = \beta_{10} + \beta_{11} \cdot EPC_{i,t} + \beta_{12} \cdot EU_{i,t} + \beta_{13} \cdot WP_{i,t} + \beta_{14} \cdot FI_{i,t} + \varepsilon_{i,t} \\ DR_{i,t} = \beta_{10} + \beta_{11} \cdot HE_{i,t} + \beta_{12} \cdot LE_{i,t} + \beta_{13} \cdot HIV_{i,t} + \beta_{14} \cdot AP_{i,t} + \varepsilon_{i,t} \end{cases}$$

The analyzed model is represented by two-dimensional model, where in the second equation as an independent variable the dependent variable forming the first equation is presented. The model with panel data has been chosen to build the multivariable linear regression model, because such type of models are more robust to

missing variables, measurement errors and the presence of endogenous variables among the repressors.

So we attempt to model following links' map:



During the simulation each equation was tested on adequacy, factors' importance; as well RESET, Hausman, Dickey-Fuller, White, Durbin-Watson, Johansen-Fisher criteria were tested. Estimates of regression coefficients were calculated via different methods:

1) Weighted least squares method was used to overcome heteroscedasticity;

2) Generalized least squares method was employed to overcome the autocorrelation;

3) Ordinary least squares method has been implemented in general case.

As a result we have such system of equations:

1. Modeling the impact of pollution on the social component of economic development of the Baltic countries:

$$1.1)\ AP_{1,t} = 41159{,}3 + 0{,}36EPC_{1,t} - 140117{,}7WP_{1,t} - 43{,}3FI_{1,t} + \varepsilon_{1,t}$$

$$1.2)\ DR_{1,t} = 66{,}98 - 0{,}22HE_{1,t-1} - 0{,}77LE_{1,t} + 1{,}45HIV_{1,t} - 0{,}0001AP_{1,t} + \varepsilon_{1,t}$$

2. Modeling the impact of pollution on the social component of economic development of Ukraine and Russia:

$$2.1)\ AP_{2,t} = 3855592{,}7 + 355{,}4EPC_{2,t} - 22547192WP_{2,t} - 12552{,}6FI_{2,t} + \varepsilon_{2,t}$$

$$2.2)\ DR_{2,t} = 26{,}7 + 0{,}7DR_{2,t-1} - 0{,}2HE_{2,t} - 0{,}3LE_{2,t} + 0{,}8HIV_{2,t} + 0{,}0001AP_{2,t} + \varepsilon_{2,t}$$

Analyzing the impact of elasticity coefficients in the first model, we can conclude that the environmental situation in the Baltic states, Ukraine and Russia mostly is influenced by water pollution, then – electricity usage, and in the last way - investment in fixed assets.

According to the results of the second model - the most influential index on the social component of the Baltic countries is the life expectancy, and ecological situation is at the second place, according to the measure of impact. As for Ukraine and Russia, the most influential index is the index of environmental pollution, and life expectancy follows it.

Differences in factors of influence can be explained by differences in the situation in the regions as regards improving the environmental situation and the policy of sustaining healthy lifestyles.

SIMULATION OF SPREAD OF RADIOACTIVE CONTAMINATION BY ARCGIS SERVICES

Yuliya Khomenko, Ievgen Ukrainets
National Technical University of Ukraine, "Kyiv Politechnic Institute", Kyiv, Ukraine

After one year of the terrible disaster at Fukushima NPP the ecological security of every nuclear facility from a huge nuclear energy reactor to a small research reactor is a topic of a big interest. The radioecological monitoring is an essential part of the safety assurance of these facilities.

Simulation is an important part of a radiological monitoring which is based on radiological and meteorological data which is collected, stored into the database and analyzed before the simulation.

Before the data will be downloaded to the database it has to be prepared in the format which is standardized and understandable for the software of the radiological monitoring system. NetCDF(network Common Data Form) is commonly used format in climatology, meteorology and oceanography applications (e.g., weather forecasting, climate change) and GIS applications that is why it can be used for representing meteorological and radiological data in radiological monitoring system [1].

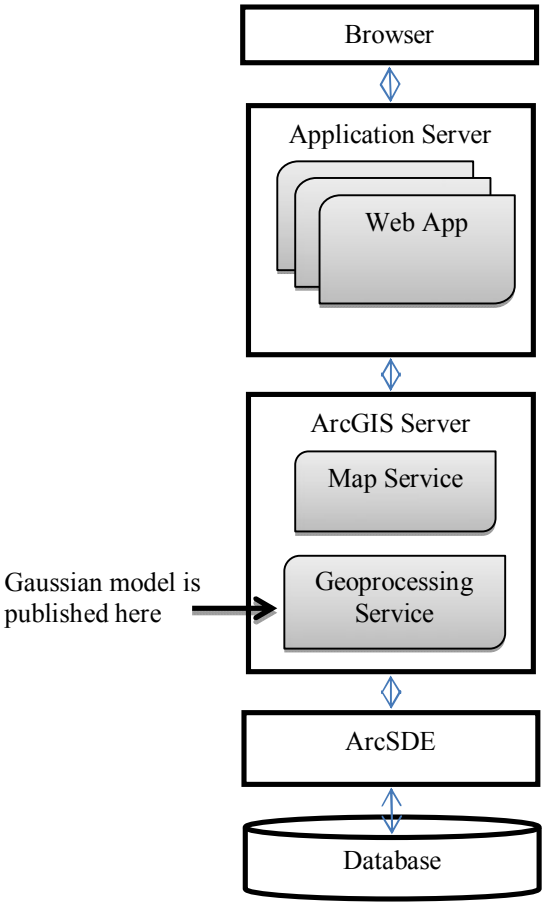
Nowadays online systems which use Web become much popular because no software needs to be install at user's desktop, laptop or other device and this software which is accessible in any browser is always up-to-day because all business logic can be updated only on server. That's why radiological monitoring systems should be Web system and use spatial data. ArcGIS software is used for these purposes. It can show the spatial data of the territory (a map), radiological and meteorological data. ArcSDE is used for access for spatial data which is in the database; ArcGIS Server is used for publication these data as MapServer.

Gaussian dispersion model is used for simulation the area polluted with radionuclides in the case of the emergency at a nuclear facility [2]. With this formula the concentration in the point (x,y,z) is calculated according to the condition of the facility, the emergency and meteorological data.

$$C(x,y,z) = \frac{QKV}{2\pi u_S \sigma_y \sigma_z} * \exp\left(-0.5\frac{y^2}{\sigma_y^2}\right),$$

In this work all calculations of the activity spread are moved not even to Application Server but to ArcGIS Server which performs all of these calculations faster. The model which is created with ArcGIS ModelBuilder is published on ArcGIS Server and is accessible from the browser [2].

The architecture of the system is shown on the following figure and consists of thin client application, two servers and database management system.



This architecture and data storage provides access to online simulation of spread of radioactive pollution in the atmosphere which is important for acceleration of calculations in the case of an emergency.

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THE SOLUTION OF ENVIRONMENTAL PROBLEMS WITHIN THE REGION

Konstantin Mikhaylovich Konorev
Kursk GSHA, Russian Federation

Now before the population of Earth there is a choice of the scenario of development of ecological safety. The world becomes more and more interconnected and fragile, the future promises at the same time both big danger, and big prospects. A.de Saint-Exupéry lips of Little Prince very precisely told: «There is such rule: rose in the morning, washed, made toilet and at once order the planet». Here if each person followed this rule.

Every year, the problem of an ecological situation becomes more and more sharp. It is necessary to be engaged in improvement of quality of environmental protection as on local, regional, federal, and at the international level.

The Kursk area following the results of an ecological rating among 83 subjects of the Russian Federation takes the 6th place. It is rather high indicator - the area concedes to only the Tambov region, the Belgorod region, Chukchi joint stock company, the Republic Altai, the Pskov area. Achievement of a high rating is caused by actions carried out in the region on: to decrease in level of pollution of atmospheric air, protection and rational use of water resources, protection of soils, plant and animal life, to decrease in formation of a waste; decrease in negative impacts on the person in zones of his accommodation; ecological education, education, population informing.

In 2011 works of nature protection appointment to the sum more 105,7 mln. are performed. rub, including at the expense of the involved means of the enterprises, the organizations – 41,3 million roubles and the city budget – 64,4 million roubles. In 2011 the means allocated at the expense of budgetary appropriations, to committee of ecological safety and environmental management of the city of Kursk, for financing of city nature protection actions in the territory of the city of Kursk made according to sections: "Forestry" – 1,8 million roubles, "Environmental protection" – 1,1 million roubles, "Accomplishment" – 57,3 million roubles.

For prevention of harmful effects of production wastes and consumption on health of the population and environment the works directed on reduction of volumes of unauthorized formation of a waste in the territory of the city of Kursk are organized and carried out. More than 3,3 thousand CBM of a waste, on the area more than 6,2 hectares are liquidated. Total amount of expenses for the specified works made 0,86 million roubles.

Following the results of last year as a whole it is possible to note that in area there was an effective system of the solution of environmental problems. Actions for stabilization and decrease in volumes of receipt of polluting substances in

environment are developed and are realized, works on the address with production wastes and consumption are optimized, new safe technologies take root.

At the international level, one of the main strategic partners of Russia on the former Soviet Union is Ukraine. For development and strengthening of ties between the Russian and Ukrainian regions the policy of creation of cross-border economic educations – "euroregions" (ER) is important.

Long-term experience of cooperation of Kursk and Sumy areas, within "Yaroslavn's" euroregion, showed that direct connections of the Russian and Ukrainian regions allow more widely and to consider more completely interests and possibilities of managing subjects of frontier areas, to develop mutually advantageous direct, cooperation connections and other forms of partnership that, finally, allows to solve a big circle of specific questions in trade and economic and social areas.

At the beginning of June, 2011 one of joint projects kuryan and symchan - major maintenance of a ground floodgate gidgouzel Konstantinovsky of a reservoir on the river Bruise of the Korenevsky region of Kursk area was complete.

The department of ecological safety and environmental management of our region together with the Ukrainian party realizes one more project in the field of ecology – complex ecological inspection of a river basin Psel within the Russian-Ukrainian border zone is conducted.

Together with the reached successes there are also problems which are among the solved. Preservation of natural riches and ensuring stability of an ecosystem – the common cause, which success depends on joint efforts of the state, society and each citizen.

THE INFLUENCE OF AIR POLLUTION ON MORBIDITY POPULATION OF SUMY REGION

Anatoliy Kornus
Sumy State Pedagogical University, Ukraine

As we know, human health and its morbidity are determined by four groups of factors: genetic health (20%), lifestyle and quality of food (50%) of the environment (20%) and level of health care (10%). On average 45% of toxic substances enter the human body with food, 30% – from drinking water, the rest – through the air. However, given airtechnogenic water and soil pollution, and along with them food, air pollution, in our opinion, is one of the most negative impacts on the population health. It leads to a large number of diseases that can cause of mortality.

Explanation of the role of environmental factors in shaping the overall health of the population and finding dependencies and relationships between these phenomena is, in our opinion, perhaps the most important problem in the regional

environmental analysis. However, reaction to the influence of different natural and economic factors are very difficult, so finding the relationships between severity and specificity of the environmental situation and level of morbidity is a key point in the implementation of health monitoring and environmental monitoring in general. To do this we must apply the most adequate methods of data processing that can clearly interpret the results. In modern conditions the application of quantitative methods of analysis necessary to obtain informative and objective results.

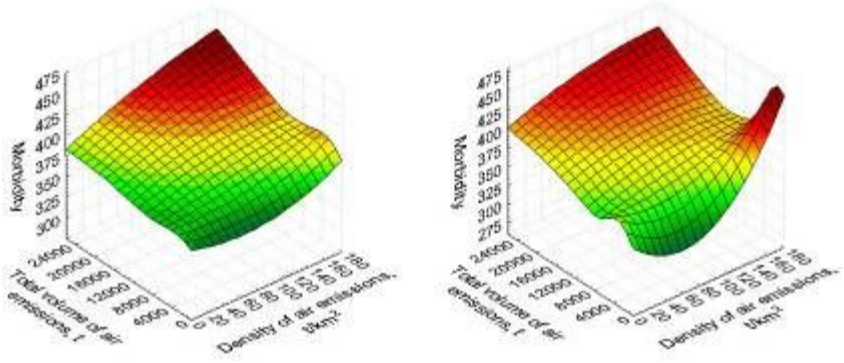
As an example application of such quantitative methods we present calculation of dependence of the oncology morbidity of population of the Sumy region from of ecological state of the air. Cancer chosen based on the fact that they are reliable markers that characterize the general state of health, and air – on the basis of the above arguments about its specific role in the negative health effects. To find the above-mentioned dependence we have used method pair and multiple correlations. Correlations were visualized using *2D* scatterplots that show the relationship between two variables X and Y (eg, morbidity and air emissions). For most indicators obtained average values of the coefficients of pair correlation (r = 0.4-0.46), which have been checked for authenticity by using of the V. Chervyakov criterion. Correlation analysis allows us not only to determine the closeness of the connection between events, but also empirical formulas to calculate dependencies, according to which for some features you can find others.

The relationship between cancer morbidity and total volume of emissions is expressed by a linear regression $y = -19952.6+65,7x$ ($r = 0.46$), the relationship between cancer incidence of population and density of pollutants emissions $y = -189.3+0.59x$ ($r = 0.44$), the connection between cancer rates and the amount of emissions from stationary sources of air pollution can be described by the equation $y = -8.13+0.03x$ ($r = 0.4$), and the relationship between the oncology incidence of the population and the amount of emissions from mobile sources $y = -9842,2+34x$ ($r = 0.4$).

The coefficient of multiple correlation of the most significant (r = 0.52) was in clarifying the dependence of population morbidity from the total volume and density of emissions. Therefore, this connection has been studied more by constructing *3D* surface graphs. Used for plotting the points fit a three-dimensional scatter plot. Instead of the original data points on the statistical charts of this type is represented by the surface, which is a smooth image data obtained by using one of the possible procedures for adjustment or conversion. This representation allows revealing hidden data structure and the relationship between three variables (emission of pollutants into the atmosphere, their density and cancer incidence of population).

After analyzing several types of graphs of surfaces which can be adjusted to our data and various smoothing methods (from simple linear function of surface features to which “smooth” the data and approximate the surface with a given level of density) in our study, we decided on the method of distance weighted least

squares and method of bicubic spline smoothing (Fig. 1). These methods of surface fitting can be useful for finding non-linear and non-monotonous relationships between medical-environmental and ecological indicators.



a) b)

Figure 1. *3D* surface graphs of depending of the population oncology morbidity (cases per 100,000 populations) on the total volume and density of air emissions of Sumy region: a) the method of smoothing splines, b) the method of distance weighted least squares.

The study showed the importance and need for medical and environmental research in the environmental analysis, which should become an integral component. It was found that the level of oncology morbidity depends on the level of air pollution, given the quantitative expression of this dependence.

MECHANISMS OF CONSIDERING ENVIRONMENTAL FACTOR IN THE FORMATION OF COMPANY'S INVESTMENT ATTRACTIVENESS

Vyacheslav Korotkyi
National University of Krivoy Rog, Ukraine

Importance of "greening" the investment activity is confirmed by recent studies, which show that "green" investment in amount of 1% of world GDP over several years may lead to a critical mass of "green" infrastructure, sufficient to lay the foundation of an integrated "green" economy on a global scale. [5] Consideration of environmental factors significantly increases the investment attractiveness of every firm, defined as subjective perception of environmentally oriented investment performance of the company (environmental aspects, environmental and economic risks, etc.). Investment attractiveness including

environmental factors is forming in the process of analyzing, evaluating and comparing different investment projects, based on calculations and expert estimates. Methodical and methodological framework of economic evaluations and formation of investment attractiveness of environmentally oriented investment projects is under development today.

We can define basic modern machinery and tools development and assessment of investment attractiveness of firms with including environmental factors, which are widely used in developed countries [1]:

1. *Implementation of environmental management and quality management* aims to identify environmental risks and develop programs to reduce them according to ISO 9000 and ISO 14000. Implementation of these systems significantly increases the investment attractiveness of organizations, that's why we consider them as one of the main mechanisms of formation and evaluation of investment attractiveness of enterprises including environmental factors.

2. *Environmental marketing* aimed at fostering the philosophy of the company, focused on the growing demand for environmentally friendly products, made without harming the nature. Its implementation also allows growth of investment attractiveness of firms in a growth market of ecological products.

3. *The participation of organizations in environmental ratings* are effective ways of greening the business. Examples of such ratings are the All-Ukrainian competition "Environmental quality and safety", in the category "Environmental excellence" winner of the last year was "Arcelor Mittal Krivoy Rog" [2]; rating of "Green companies in Ukraine," made by "Investgazeta"; rating of 'Social responsible business' by journal "Guard" and others.

4. *Equator Principles*. In their application within a specific investment project starting point for the bank will be the level of environmental and social risks of this project, and assigned him a particular category depending on the level of risk. If the project is with increased risk, from the borrower is required rating of ecological risk and the basic requirements of disclosure for local communities. Terms of credit provide ongoing reporting and monitoring conformance [6].

5. *The Global Compact - code of conduct*, which consists of ten human rights, the environment and anti – corruption principles. This voluntary international initiative brings together about 5,800 companies that committed themselves to these principles, among them there are companies, organizations and academic institutions. By joining the Global Compact Company claim that it shares the conviction that business practices that is based on universal principles, promotes greater stability, justice and contributes to a prosperous societies. In Ukraine there are more than 140 participants-members of the GC [4].

6. *Evaluation of participation of enterprises in the state, regional and corporate environmental programs*. Analyzing such participation can be used in the formation of investment attractiveness of companies, indicate social responsibility and active social position of the business.

7. *Compliance with legislation in the sphere of nature*. For the development and assessment of investment attractiveness of companies the following environmental features can be used [1]: presence of positive conclusion of environmental review and results of environmental impact assessment, the presence of a positive opinion of inspectors which are engaged in environmental control, lack of notes to address the identified violations, environmental passport and declaration of Industrial enterprise security, presence of insurance policies on environmental insurance.

8. *Environmental Performance Evaluation* – Guidelines gives guidance on the design and use of environmental performance evaluation, and on identification and selection of environmental performance indicators, for use by all organizations. In accordance with ISO 14031 "Evaluation of environmental performance."

9. *"Global Reporting Initiative» (GRI)* - a voluntary international network based on collaboration between companies, employers, investors, auditors, and other stakeholders. The purpose of Global Reporting Initiative - to promote the use of non-financial companies reporting based on the triple criteria - economic, environmental and social performance. GRI has developed principles and indicators for such accounts, and it is the largest international initiative of this kind [3]. More than 1000 companies in 60 countries now use the GRI. In Ukraine, 4 companies prepare their financial statements by standard of GRI - this SKM, DTEK, Metinvest and Obolon.

Currently, when assessing the consumption of natural resources all the methodological approaches are used. The use of these mechanisms, participation in national, regional and corporate environmental programs, global initiatives, implementation of international environmental standards greatly increases its investment attractiveness and competitiveness.

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COMPLEX ECOLOGICAL ESTIMATION OF MAN-CAUSED POLLUTION STATE OF POPULATION AGGREGATE TERRITORY STATE

D. I. Emelianova, M.M. Kozulia
National Technical University "Kharkov Polytechnic Institute", Ukraine

Research Aims. The aim of the research is to implement the complex technique of environmental repercussion based on interconsistency of MIPS analysis and ecological risk, connected with the socioeconomic object state, with the health risk for the systems of systems study, based on the complex ecological system (CES) concept. According to the research aim, the following issues are to be made:

1)to determine the MIPS- and risk analysis technique of the researched objects in the ecological safety system in order to define the ecological compatibility rate (negative no effect on the objects of biosphere and human being);

2)to calculate the ecological state assessment of man-induced impact in accordance with the defined technique and provide the recommendation concerning the abidance of ecological safety requirements.

Research results analysis. The aim of the corporate approach, concerning the decrease of socioeconomic consequences after the man-induced and natural emergencies and ecological risks minimization, is to provide modern approaches of man-made and natural safety regulation on the basis of the systems of systems approach, which is determined by the formation of the complicated corporate research object, as well as the estimation of the ecological risk, based on the MIPS- and risk analysis, for this object and its integral parts.

In accordance with so called corporate approach of ecological analysis, the following should be made:

1)to form the appropriate corporate ecological system for the research object: to define economic, social and ecological components (the latest is in the focus of our attention)

2) to find out the economic component of MIPS numbers in order to determine ecological state of components; to define the value of ecological risk and health risk, correlating the latest with ecological state of ecological-and-economic component of the CES;

3)to find out the connection between the influence of CES socioeconomic component on ecological system in the form of functional dependence of health risk from the ecological risk of natural (state of environment) and man-induced (discrepancy of economic content according to ecological safety request) origin.

In our work we have analyzed the source of water supply pollution tendency on the basis of experimentally obtained monitoring data of research area, according to the following factors: organoleptic properties (chromaticity, translucency),

general characteristics (pH, alkalinity, general hardness), chemical characteristics (chlorides, iron, Ca, synthetic surface active matters (SSAM)), toxicological (ammonia, NO_3, NO_2) and microbial characteristics (microbial number, coliform index). Taking into account the hazard assessment, according to the pollution rate change tendency (environmental pollution index) (fig. 1).

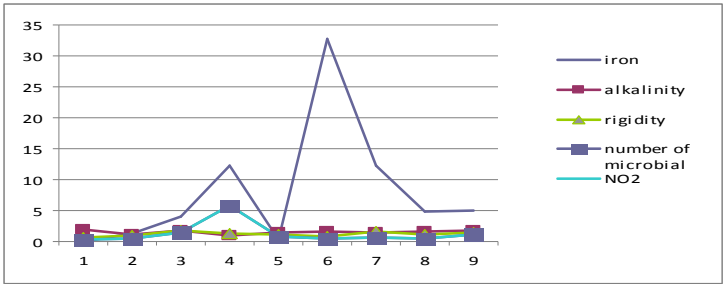

Figure 1. Pollution tendency diagram on each block of the hazard area

Consequently, the range is an ecological hazard for the environment. The drainage system of the region appeared to be the most affected by the man-induced influence. The monitoring data concerning assessed the dangerous condition of drinking wells and calculated their ecological risks:

$$Risk = -ln(P), P = \frac{\sum n_i}{N},$$

where $\sum n_i$ is the sum of all cases exceedance of antipollution standards value, i.e. $\sum n_i = \sum \frac{C_i}{ГДК} > 1$ (table 1).

Table 1 – Environmental Risks

	5 Pushkinskaya Street	15 Pushkinskaya Street	Lermontova Street	Mayakovskaya Street	Prospect Budyonnogo
Iron	0,57	0,579	0,63	0,33	0,1
Water alkalinity	0,169	0,11	0,3	0,4	0,17
Water hardness	0,078	0,17	0,00025	0,15	0,6
Microbial number	0,11	0,33	0,025	0,45	0,89

Summary. Probabilistically entropic and risk-analysis analysis for ecological hygienic assessment of anthropogenic loaded territories given in the article: internal and external levels influence is determined on source water supply. Approaches determined to account the ecological component in definition of population health risk.

ENVIRONMENTAL PROJECTS IMPLEMENTATION EFFECTIVENESS IN BUSINESS STRUCTURES WITHIN THE CORPORATE SOCIAL RESPONSIBILITY

Antonina Krus, Olena Tarasova
National University of "Kyiv-Mohila Academy", Ukraine

Rapid economic growth impacts our environment and consequently ecosystem services greatly. Recognizing the value and the need for conservation of ecosystem services is essential to business, the latter can reduce the risks as well as provide new opportunities for further development. It is quite possible that business can become a leading sector in environmental protection. As social corporate responsibility (CSR) in Ukraine becomes more and more popular, companies implement projects on energy efficiency, climate change, green building, and biodiversity conservation. However, the projects' effectiveness should undergo assessment in order to prevent green-washing.

This research aims at evaluating the companies' performance in environmental projects implementation within the CSR. Its another attempt is to prove that environmental projects are a new trend that could become an effective tool for environmental protection.

Analysis of Global Compact members' reports has shown that current environmental projects cover a very narrow field, and that not all companies carry out their obligation to report on time and in accordance with the requirements.

During the analysis Ukrainian and international environmental projects were divided into categories, e.g. eco-education, biodiversity conservation, energy efficiency, climate change, environmental management and grouped according to the business sectors. Finally, after the consistent analysis of the business sectors the recommendations on the most suitable environmental projects for the companies were developed.

Interviewing socially responsible enterprises about the business impact on ecosystem services and about their willingness to invest in various types of environmental projects has proved that the implemented projects cover the most popular areas (e.g. climate change). There is very little knowledge among the leading companies about other possibilities. However, potentially they are open to other areas, for example to taking action on biodiversity protection.

Based on a range of approaches to project effectiveness evaluation eight main groups of indicators were identified and applied to three Ukrainian cases. The evaluation of selected projects has shown that in Ukraine the business environmental awareness is only starting to grow. Gathered data presents that many environmental undertakings do not meet the requirements and lack the necessary indicators in global terms. However, one can prove the partial effectiveness of the projects in Ukrainian realities and make the positive prognoses

for the future. Moreover, it is obvious from the conducted research that environmental projects are currently becoming a new trend in business environment. These are sure to become an effective tool of the future environmental protection in Ukraine.

In conclusion, it is important to point out the environmental crisis our society is facing. At the moment it appears that sustainable development strategy is the only right way to last in the present conditions. From this point of view corporate social responsibility is one of the main tools making business consider not only its profits, but also the impact on the society and the environment. Companies should also realize that corporate responsibility is not limited to charity donations, cutting back carbon or planting trees. It lies deeper in re-imaging companies from within, establishing a new logic of business competition, and, most importantly, understanding how effective tool environmental projects can become in achieving goals.

ECONOMIC AND ECOLOGICAL CONVERGENCE OF UKRAINIAN REGIONS

Oleksandr Kubatko, Oleksandra Kubatko
Sumy State University

In the current global and interdependent world the stability of economic system depends on the stability of its elements. Spatial differences in levels and growth rates of economic, ecological and social indicators are becoming key point policy objectives in modern world.

Historically the development of former USSR economy under the conditions of central planning created major differences among national economies. Even within boundaries of one country the regions were not equally developed. In Ukraine, the Eastern and South regions were and still are much more economically developed than West and North. Since that time Ukrainian economy has undergone a lot of transformation reforms to strengthen the national economy, but the gap between poor and rich regions in Ukraine is still substantial.

Economic reforms in Ukraine were performed without major consideration of the regional factor. Statistic data shows significant regional economic disparities in Ukraine during 1990s. Thus, in 1998 regional per capita income was 888 UAH in Vinnytsa region, 886 UAH in Volyn region and 1691 UAH in Donetsk region or 1951 UAH in Dnipropetrovsk regions. That is on average the difference between poor and rich regions within one country was about two times. Considering the ecological indicators such as per capita emissions, rich regions were more than 20 times “dirtier” than poor ones. Major regional differences in terms of basic social living standards may cause serious economic, social and ecological problems. Therefore development and transformation of national economy should consider not

only structural reforms and increase in per capita GDP, but special attention has to be paid to equilibration (leveling) of the regional development.

The idea of convergence in economics (also sometimes known as the catch-up effect) is the hypothesis that poorer economies' per capita incomes will tend to grow at faster rates than richer economies. As a result, all economies should eventually converge in terms of per capita income. Developing countries have the potential to grow at a faster rate than developed countries because diminishing returns (in particular, to capital) aren't as strong as in capital rich countries. Furthermore, poorer countries can replicate production methods, technologies and institutions currently used in developed countries.

In empirical researches there are basically four main approaches to study convergence processes: sigma convergence, absolute beta convergence, conditional beta convergence and stochastic convergence. Historically according to Sala-i-Martin (1994), first appeared sigma convergence approach, which compares standard deviations, variances for the different economic indicators across time for specific groups of countries (regions). Absolute convergence means that if the regions are fairly similar and under same conditions (e.g. within one country or Union) they should approach the same absolute level of steady state in all social standards (economic, ecological, social parameters). Conditional beta convergence means that it is impossible to achieve unique steady state by all countries (regions), due to the differences in national, natural or historic achievements. And all separate territories have its own steady state. The last one stochastic convergence relies on time-series methodology.

According to Lall and Yilmaz (1999) the economic convergence can be estimated as a modified Cobb-Douglass production function:

$$\log(y_{it}) = a_0 + b_1 \log(y_{i,t-1}) + c_k Z_{kit-1} + d_i D_i + e_i T_i + \varepsilon_i \quad (1)$$

Where, Z – is vector of k additional regional characteristics (human capital, public capital, etc.). D – is a vector of regional dummy variable. T – is vector of dummy time variables.

Mostly we are interested in the sign of the b_1 coefficient, that is estimating "difficultness" to overcome higher initial levels of income. The hypothesis of economic (ecological) convergence will be accepted if b_1 is negative. The model 1 also will be used and tested in our research. The special attention will be paid to the coefficients of b_1, which has following economic interpretation – one percent per capita income change in base year lead to b_1 percent change next year.

We have re-done the above mentioned model (1) in order to have per capita income growth rates as a dependent variable. However, the economic justification of the equation (2) has to be developed in more proper way.

$$r_{it} = \beta_0 + \beta_1 y_{i(t-1)} + \beta_2 K_{it} + \beta_3 L_{it} + \beta_4 P_{it} + \beta_5 X_{it} + u_{it} \quad (2)$$

where r_{it} – the growth rate of income per capita in region i in year t;
$y_{i(t-1)}$ – per capita income in region i in the previous year;
K_{it} – real capital stock in region i in year t;

L_{it} – *employment in region i in year t;*
P_{it} –*pollution in region i in year t;*
X_{it} – *time dummies from 1999 to 2010.*

It is difficult to develop the concept of sustainable development, where some regions prosper and other others are in decline. In economic theory it is believed that in the long run, regions within a country must reach a certain level of equilibrium state (steady state) in the economic, environmental and social fields. The possibility of achieving an equilibrium state means that the regions with less economic potential must develop their economies more rapidly to match the leaders. Similarly, should change and quality of life. Convergence does not mean the same structure of production, landscapes, social infrastructure, however it is expected to align the quality of life of the population and environment.

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THE SHADOW ECONOMY AND ITS INFLUENCE ON AN ENVIRONMENT

V.M. Kyslyi, Victoria Kubatko
Sumy State University, Sumy, Ukraine

Shadow or underground economic activity is a fact of life around the world, and there are strong indications that it is increasing. Most societies attempt to control these activities through various punitive measures or through education, rather than through reforms of the tax and social security systems which could improve the dynamics of the official economy. Gathering information about shadow economic activity is difficult, because no one engaged in such activity wants to be identified. Obtaining accurate statistics about the allocation of a country's resources in the shadow economy is important for making effective economic policy decisions. It is crucial to know who is engaged in the shadow economy, and with what frequency and magnitude such activities occur. The phenomenon that goes under various names including shadow economy, black economy, underground economy and so on started attracting the attention of economists and sociologists in the second half of the 1970s.

Attempts to measure the shadow economy first face the problem of defining it. There are various definitions of the shadow economy. One commonly used working definition is: all economic activities that contribute to the officially

calculated (or observed) gross national product but are currently unregistered. Shadow economy is also known as underground economy refers to a portion of the economy that goes largely undetected by taxing authorities. It includes income generated through illegal means, such as prostitution or gambling, as well as legitimate but cash-based activities such as online auctions or bartering services.

Shadow economy in Ukraine is considered to be one of largest in the world. According to various estimates, informal sector accounts for 40-60% of GDP. Ukraine's economy is a very open one – foreign trade accounts for 50-60% of GDP, but there is no (typical for other economies) feedback between export growth and development of production – this is just one of indicators confirming the existence of a considerable informal sector.

The causes that lead to the creation of a shadow economy are several but, for the most part, they can be compressed into four major categories: taxes; regulations; prohibitions; and corruption. The taxes that have been often assumed to be more connected with the shadow economy are the following: income taxes; value added taxes; excises; social security taxes; foreign trade taxes; and taxes on capital transfers. For these taxes, operating in the shadow created the possibility of evading paying them. Both the rates at which taxes are levied and the capacity of the tax administration to uncover these activities are important. Regulations are also important instruments of governmental policy. many of these regulations raise the cost of operating in some activities or even make it impossible or difficult to operate legally in them. As a consequence, many activities go into the shadow partly to avoid complying with these regulations and partly to avoid paying taxes. Prohibitions are special forms of regulations and they play or can play an important role in pushing people and resources off the official economic track. Another troublesome area is that of corruption. Corruption can be political or bureaucratic and can generate high incomes to those who engage in corrupt activities.

Nowadays firms in an imperfectly competitive formal sector produce a final good using a polluting intermediate good. A large part of the informal sector in developing countries is concentrated in manufacturing, servicing and retailing activities such as bleaching and dyeing of garments, leather tanning, brick manufacturing, automotive repair, metalworking, and hawking. Most of these activities have considerable negative environmental impacts. Effluents from bleaching, dyeing and tanning contain hazardous chemicals which, when disposed of improperly, can pollute rivers and groundwater. Brick kilns in the informal sector are often fired using cheap fuel such as used tires, plastic refuse, and used motor oil which create air pollution. Street vending in many developing countries cause littering and congestion The firms can either produce the intermediate good or purchase it from a price-taking informal sector. Although often characterized as a collection of street merchants, the shadow sector actually includes many pollution intensive activities such as leather tanning, brick and tile making and metalworking. Given the sheer number of such firms in developing countries, the aggregate environmental impacts can be very significant. But controlling pollution

created by informal firms is especially difficult — even by developing country standards — for a number of reasons. By definition, informal firms have few preexisting ties to the state. In addition, they are difficult to monitor since they are small, numerous, and geographically dispersed. Finally, they sustain the poorest of the poor. As a consequence, they may appear to both regulators and the public as less appropriate targets for regulation than larger, wealthier firms.

Economists are trying to figure out the nature and characteristics of the shadow economy and develop methods of its calculating. There are a significant number of measurement methods that have been used to estimate the size of the shadow economy in various countries. In general, three approaches to measuring the shadow economy are used: micro-, macromethods, and modeling methods. Most of the methods have been criticized because of the serious flows they have. But all of this methods have disadvantages. Besides there is no method which gives an opportunity to define the influence of the shadow economy to environment. Today one of the important task of economists is to develop and improve methods of identifying and calculating the level of shadow economy for pollution control.

While de-shadowing of the economy should unquestionably be the long-term priority for Ukraine and international community, it is nonetheless important to build capacity for assessment of existing informal sector, improve methodologies for such assessments to allow for relevant adjustments to national development forecasts and thus strategies. Not only the share of shadow economy, but also its direct and indirect implications should be analyzed and used for projections of Ukraine's economic development.

ECOLOGICAL BUSINESS AS AN INNOVATIVE WAY OF ENTREPRENEURSHIP

Alina Lavrynenko, Olena Shkarupa
Sumy State University, Sumy,Ukraine

Tendencies in business development show active transformation towards information society, but this kind of changes are often accompanied by violations of ecological balance and sustainable development principles. Ecological aspect of economic activity is strongly influenced by the uncertainty factor in Ukraine, because society nowadays only begins to realize the value of ecological products and services. That is why creation of the efficient ecological entrepreneurship, which can contribute to the environmental reproduction, remains the challenging issue.

Ecological entrepreneurship is an independent production, research, financial or other activity, carried out at own risk for generating profit from property use, sales of products or services, which are aimed at preservation of the environment and reducing the negative impact of anthropogenic factors as well as

evaluating their impact and securing the environmental safety. By ecological entrepreneurship we also mean any kind of activity, which produce positive environmental effect, based on doctrines, which define the priorities of sustainable development of economics.

There are three groups of preconditions of the emergence of ecological business. They are: economic, ecological and social. The sharp increase in production and the emerging of innovative technological tools represent the first group. By ecological preconditions we mean decline in people's health and uncertainty in the future. Social ones are people's wish to consume ecological goods and services and to be ecologically stable.

Every entrepreneur, who decided to work in this sphere, faces several stages and targets. To our mind, they can be organized it the following scheme:

1. Definition of the ecological business principles (social orientation, innovative component or ecological responsibility).
2. Definition of the sphere of activity (choosing the direction according to real opportunities and future prospects, drawing up the business plan).
3. Searching for funding (own capital, debt capital or grants from the government).
4. Governmental stimulation (realization of governmental programs towards ecological entrepreneurship, getting subsidies and tax privileges).
5. Project development and its implementation.
6. Environmental goods' market formation (creating and filling in the new market niches).

It is worth saying that entrepreneurs subconsciously should care not only about earning profit, but also social benefits their products and services produce. We think that realization of all the actions listed above will definitely produce synergetic effect and undoubtedly lead to the environmentally stable economy.

THE ADVANTAGES OF THE INVESTMENT PORTFOLIO DIVERSIFICATION

Daryna Leus
Sumy State University, Sumy, Ukraine

Unlike the investment approach of classic security analysis that focuses on individual security selection, portfolio investment is a modern investment method that involves asset allocation and diversification to construct a collection of investments. The biggest challenge in investing is the uncertainty of an investment's future performance and thus the risk of potential investment losses. Not counting on investment results of single investments, portfolio investment can hedge investment risks by canceling out different investment returns among component investments.

Before you make even one investment, you must decide on your optimal investment strategy. Two very different strategies are active portfolio management and long term investing. The strategies that you choose for an optimal trading strategy will depend largely on your investment goals. Long term investing offers more benefits and rewards, while active portfolio management is very hands on and may mean checking you investments frequently. The optimal investment strategy is to use long term investing and passive portfolio management instead active portfolio management.

Since portfolio investments tend to vary a lot, they include most kinds of investment instruments. Stocks are the most common, but they are closely followed by bonds, which are investments in business debt instead of business equity. This is another reason economists prefer direct investment, which must be equity investment in order to control a company.

The underlying reason for a diversified portfolio is that it is typically less risky than a concentrated portfolio. The old caution against "all one's eggs in one basket" applies.

To diversify your portfolio, you'll want to utilize various investment instruments such as stocks, bonds, and cash and cash assets. This diversification will ensure that you enjoy different rates of return as market conditions fluctuate, with each investment responding differently. This is a benefit to investors because markets are unpredictable. For instance, when interest rates fall, the rate of return on more secure investments like money market funds and bonds, increases with the opposite occurring for high-risk equity investments like stocks. Such an approach minimizes risk --- a situation that would be nearly impossible without a well-considered portfolio.

Besides diversifying your investment assets, you should diversify across categories or market segments, which provides an additional benefit in terms of risk aversion. Political, economic and social factors all affect markets, but a diversified portfolio can help protect against such vagaries.

WHO ON EARTH IS THE SCAPEGOAT OF CLIMATE DILEMMA

Pengyu Li
Uppsala University, Sweden

Regardless of the Durban conference has delivered historical breakthrough or triggered "almost useless" debates, the arguments between major powers on offset responsibilities still up in the air. When the developed countries were demanding a legally binding emission promise from China and Indian, emerging countries with large populations intend to frame the disputes on paying historical debts at the same time. Even though productive studies like "contraction and convergence", "Greenhouse development rights" are widely advocated recent

years, innovative ideas like "carbon budget proposal", broader "human development approach" are gaining substantial positive reviews, a mutual understanding is still elusive due to various interests. In a nutshell, the current climate dialogue is a situation without an equilibrium agreement on who the climate negotiators should represent in a power shifting era.

This report was inspired during my master thesis composition stage and conducted individually starting from February, 2012. The general methodology used here is literature review based on todays featuring theories, aiming at creating a better understanding of feasible solution dealing with this academic dynamic.

The report concludes at the end that everyone given the citizen rights in the name of earth should be the fundamental principle of academic theories relating to climate justice. To recognize that in the midst of a magnificent diversity of cultures and life forms we are nothing but one human community is the key point to fulfill our shared visions. As the international climate conversation is going to be more diplomatic, theoretical studies based merely on individual or national interests can not clear up the problem anymore, because climate issue is our common interest, the lacking of integrated indicators and holistic view toward climate issues will push any political effort into a dead end. Under the common threat of mankind, legal right to express human behalfs should be the weight of political negotiations and academical studies. A global citizen concept cooperates the maximum possible strength of the international society to fight against future climate risks, it provides comparatively the broadest adoption of climate democracy and justice, hence increased the fairness of climate negotiation. Correspondingly, the conceptual framework can not be function without an appropriate international cooperating system, this should be a forum which can be independent from individual influence, represents the bottom of the international society who is undergoing the infringement of climate change right now.

In order to reach a recognition of the conceptual subjectivity out of individual struggles (Alexander, 2003), a fairly treated "earth citizen" rights with its all-around and comprehensive characteristics is a sound solution to reconcile past issues, present welfare and future needs. It requires a documented earth constitution to take care of human welfares, in which the demand of historical obligations should not be an extra burden for the future generations who have already willing to take proper actions in the future. If not the case, the dragging of negotiation time will make everyone dwelling on this planet the scapegoat instead of any individual nations.

MAIN DIRECTIONS OF TRANSPORT STRATEGY FOR UKRAINE

A.V. Liamtsev
Sumy State University, Ukraine

Total motorization of the population creates a new lifestyle and provides mobility. Thus, in the period 2005–2011 in Ukraine the number of cars in private ownership increased by 22%. Along with the undoubted benefits it leads to an increase in environmental impact and significant energy costs. At the same time social standards of passenger traffic decline. It is describes by such indicators as capacity of municipal electrical transport and large buses, the regularity of movement. 92% of streetcars are being operated more than 15 years, subway cars 78%, 63% trolley, and 58.9% trains are being operated over 25 years. Enterprises of public passenger transport are characterized by unprofitability due to low tariffs, inadequate compensation for their costs of transportation of privileged passengers, ineffective system of collecting revenue from urban and suburban passenger transportation.

To determine the key problems of the transport system of Ukraine, principles and priorities of its development until 2020, in terms of national needs and interests, was developed transport strategy, which provides complex legal, organizational and economic measures. Its implementation will significantly improve the efficiency and greening of the transport system as a whole, sustainable economic development and welfare of Ukrainian based on social, economic, financial and environmental principles.

In particular, environmental principles include:

• priority of environmental safety, mandatory compliance with environmental standards and regulations in the transportation business;

• pollution prevention and negative effects on human health as a result of intensive development of road transport;

• implementation of the economic mechanism of nature and environmental activities on the basis of "user pays" and "polluter pays" principle;

• compliance with international legislation concerning transport of dangerous goods and setting up the training of agents carriage of dangerous goods;

• encourage the priority development of energy saving and environmentally friendly transport modes and intermodal technology.

The priorities of the state Transport Strategy must be:

• development of transport infrastructure, its modernization and compliance with European standards, building a network of international transport corridors, high-speed highways and network of checkpoints across the state border of Ukraine and, in particular, preparation of transport infrastructure to host the 2012 European Football;

• improving social standards of transport services;

• integration of transport system of Ukraine into European and world;

• accelerated adaptation of national legislation to European norms and standards;

• implementation of regulations that comply with the provisions and requirements of international agreements;

• development of export of transport services, effective implementation of Ukraine's transit potential, increase competitiveness of domestic transport in the international market of transport services;

• improving the investment climate, investment on terms of concessions, public-private partnerships, improvement of vehicle leasing;

• creating an enabling environment which will ensure the attractiveness of transport activities to attract private, including foreign, capital;

• implementation of effective pricing policies to ensure balance of society interest, transport companies and users of their services;

• promote sustainable transport by providing the benefits of environmentally friendly and energy efficient modes of transport, reducing transport of anthropogenic impact on the environment, as well as through the development of public passenger transport as an alternative to rapid motorization of the country.

Main directions of the Transport Strategy include, above all, the modernization of the transport system, including development of transport infrastructure.

ENVIRONMENTAL PROBLEMS OF THE POPULATION CENTRES' LANDS DISPOSAL OF KHMELNITSKY REGION

Oksana Lobanova
Lviv National Agrarian University, Ukraine

The rational disposal and natural resources protection are important factors of social and economic development. It is known that environmental problems come into being when the disposal of natural resources is incorrectly realized and intensive agricultural activities are implemented without introduction of environmentally sound technologies. Ukraine belongs to those regions with a high degree of development of the territory and its resources, high compactness of the population, but if an inhuman destruction of environment won't stop, tomorrow the nature might not be.

Environmental situation, which exists in a modern town, affects not only the living conditions, but also the component and territorial structure of the economy. The production development is influenced by certain restrictions, which include environmental, economic and sanitary-and-hygienic living conditions. Relations in the "environment – town" system mostly appear in towns, because cities form the environment more actively and the feedbacks are vividly expressed.

In our research the current state of the pollution of the settlements of Khmelnitsky region in general and its various components in particular will be analyzed.

Among them – an air and its main pollutants are industrial enterprises and transport. In 2010 there were 9,208 sources of the pollutant emissions, that is more than 4.5 thousands in 1985, but less than 900 sources in 1995. The amounts of pollutant emissions in the air slightly decreased due to the shutdown of some industrial enterprises (126.4 thousand tons, in 2010; 705.8 thousand tons, in 1990), however an increase of emissions into the atmosphere due to transport is observed (51.6 thousand tons, in 2010). In the air pollutants structure the food industry, power industry; chemical industry and non-metal products production take the main place. On a par the emissions of one enterprise are the highest for non-metal products production (101.4 tons), electricity (50.9 tons), chemical industry (40.8 tons). The main emissions in air are dust, soot, carbon monoxide, nitrogen oxides and others. There are great amounts of these emissions in the Khmelnitsky and Kamenets-Podilsky. In areas of towns and small towns of the region that don't have developed industry, the concentration of such emissions is the lowest. These regions include: Letychivsky, Starosynyavsky, Yarmolynetsky, Bilogirsky, Vinkovetsky, Novoushitsky. Thereafter, the towns and villages in these areas are "the cleanest". But even in those areas where air emissions do not exceed the norm, these emissions do not always comply with its chemical composition.

The problem of water pollution and its rational use is one of great value. The need for fresh water is not satisfied in most towns and it is a limiting factor in waterbase industries. This falls within such towns as: Slavuta, Netishyn, Sataniv and Vinkivtsi. The significance of this factor increases is strengthening by rather polluted sewage, making it impossible to use many of the rivers in some areas for commercial purposes.

Geoecological situation in the region is developing under the influence of objects that impose an impress on all nature and human health components. These objects include Khmelnitsky NPP (Netishyn), chemical industries, oil storage facilities, military installations, gas pipelines.

The location of the Khmelnitsky NPP in the place with unfavorable hydrogeological and seismic conditions makes it dangerous from an environmental point of view: the lack of territorial resources for the construction of the Khmelnitsky NPP as a result of unfavorable hydrogeological, geological seismic conditions affecting the structure of local resources even further increases the shortage; total unsuitability of areas for disposal and long storage of radioactive waste; acute shortage of water resources; increased potential territory ability to contamination (especially the atmosphere, water bodies and soil).

Scientific O.Romaniv's works (2003) show increasing disease incidence of children in Netishyn and in surroundings. In her opinion, the most complicated environmental situations in terms of integrated environmental load are in

Slavutych, Khmelnitsky and Kamenets-Podilsky regions. Herewith the toxic waste data, the level of air, soil and surface pollution were taken into consideration.

The environmental conditions analysis in Khmelnitsky region gives a reason to single out the following groups, according to the environmental situation: 1) towns and villages with normal environmental condition (pollution of nature components does not exceed the standards) – Nova Ushytsya, Vinkivtsi, Letichev, Stara Sinyava, Bilogirya, Teofipol, Izyaslav, Yampil, Antonini, Grytsiv, Bazalii, Sataniv, Zakupne, Chemerivtsi, Lozove, Derazhnya Medzhybizh Vovkovyntsi; 2) urban areas with intense environmental situation (pollution indices is exceeding) – Gorodok, Slavuta, Polonne, Starokostiantyniv, Shepetivka, Yarmolyntsi, Viytivtsi, Narkevychi, Poninka; 3) towns with sharply emphasized environmental situation (pollution indices is exceeding) – Kamianets-Podilsky, Khmelnitsky, Netishyn, Dunaevcy, Volochysk.

For each of these groups there are certain peculiarities in the development of the economy. Thus, in the settlements of the first group there are no environmental restrictions as to the location of industrial enterprises and for the second and the third groups of such restrictions are quite significant, they should develop production, which do not harm to the environment.

Ecological situation in urban areas, as well as in region, may be improved only under the terms of radical changes in management system and improvement of branch and territorial structure of the economy. They are as follows: construction of environmentally-appropriate models of urban areas; ensuring of the rational disposal of lands; land exploitation only for the purposes and in accordance with the prescribed mode of use, conditions of removal, storage and application of topsoil; state control over the observance of legislation in the process of land dealings control.

IMPROVING OF INSTITUTIONAL AND ECOLOGICAL COOPERATION WITH EU: FORMS INVESTIGATION AND GRAVITY MODEL IMPLEMENTATION

Olha Lukash
Sumy State University, Ukraine

While national social and economic systems of countries face global world changes the question of institutional cooperation inside and outside of emerging social and economic systems such as euroregions, countries that are partners in transborder cooperation, transnational corporations etc. becomes more and more actual. European Union becomes wider and wider, it expands it boundaries, but if EU policy still save national identities, national discourse, do not destroy national institutions? How do EU's discourse influences on institutional cooperation inside EU countries, inside EU and outside EU – countries that border with EU? Do

consequences of global changes for emerging social and economic systems consist of improving of institutional cooperation or of destroying the national stable systems? *New* changes that are caused by *new* policy of *new* leaders in economics and in society result in advantages and disadvantages for modern system of national and international institutions. So, the aim of the given research is to investigate the form and the expression of the EU's international discourse and to create methodic approaches for improving *institutional cooperation* between EU's and bordering countries.

In globalization era new types of international cooperation became significant. One of such types of cooperation is transborder cooperation. While implementing this cooperation into practice the borders of countries are gradually disappeared. Number of economic and social advantages as well as disadvantages can be named. In the given paper author develop scientific and methodical principles for creation of logic-structural framework for implementation mechanism of transborder cooperation. Author proposes definition of TC mechanism as a complex system of elements (subsystems, participants) which have direct and indirect connections between themselves and are created and make their activity aiming to achieve clear defined purpose. The logic-structural framework of transborder cooperation consists of providing and institutional subsystem; functional subsystem; adaptation and instrumental subsystem; results-and-purpose subsystem; participants of direct and indirect impact; direct and indirect interconnections between all components. One of the main blocks of the scheme for transborder cooperation mechanism is *institutional subsystem*. The detailed description and explanation of institutional subsystem for emerging social and economic systems is given on example of transborder cooperation. It is suggested by author that both existed institutions of countries and new institutions of emerging social and economic systems should take into consideration the strategy for sustainable development achievement. Author proposes that this strategy can be realized due to following next principles and implementing them one by one: decreasing unsustainability of existed institutions, creating sustainable institutions, creating of totally new type of renovated institutions.

The paper presents the principles for constructing the effective framework, which could be implemented in the transborder cooperation for ecological development of regions involved in this cooperation. The research discusses and suggests environmental and economic tools for such an implementation. In particular, suggested approach allows policy makers to account for environmental criteria in their decisions related to transborder cooperation, which is omitted in the existing approaches. Based on estimation the factors of both environmental and economic efficiency we develop the strategy for improving combined efficiency of transborder cooperation aiming to achieve sustainable social, ecological and economic development.

To our mind to have possibility of making the estimation of environmental and economic efficiency of transborder cooperation system of clear and complete

indicators is essentially needed. This system should consist of such indicators, which allow making clear and understandable conclusions and suggesting appropriate regional development strategies. Also the important stage for ecological regional development as important task of transborder cooperation is to create effective transborder cooperation mechanism, main element of which is multilevel governance. Thus, in the paper system of environmental and economic indexes and criteria, which is the basic element of adaptation and instrumental subsystem of transborder cooperation mechanism, was created. It allows accounting for environmental factors and economic instruments influence on transborder cooperation efficiency. And also we suggest the complex transborder cooperation mechanism that consists of the following elements and can be presented as a scheme: providing and institutional subsystem; functional subsystem; adaptation and instrumental subsystem; results-and-purpose subsystem; participants of direct and indirect impact; direct and indirect interconnections between all components.

To the author's opinion while making EU's discourse as well as other emerging social and economic systems' discourse it is appropriate to use *gravity method*. Taking into consideration this suggestion it is important to improve scientific methodic and practical approaches as for gravity method implementation while creating and investigation clusters of institutional cooperation on both regional (national) and interregional (transborder, international) levels. Author examines peculiarities and systemizes and structures methodic bases for gravity models implementation in making EU's discourse.

In conclusions author examines and explains the nature of factors of gravity increasing/decreasing between national and international institutions, and justified accordance the institutional cooperation and the EU's international discourse creation to gravity model.

MODERN PARADIGM OF ECOLOGICAL MARKETING

Lyudmyla Maksymchuk
Kyiv national Taras Shevchenko university, Kyiv, Ukraine

Green marketing refers to the process of selling products and services based on their environmental benefits. Such a product or service may be environmentally friendly in itself or produced and packaged in an environmentally friendly way. Advertising and promotion of such a product often makes claims of less environmental impact in terms of energy, materials, processes, or toxic substances [1, 2].

Firstly, we should identify what is greed product. There is no widespread agreement on what exactly makes a product green. Some general guidelines include that a green product:

- does not present a health hazard to people or animals;
- is relatively efficient in its use of resources during manufacture, use, and disposal;
- does not incorporate materials derived from endangered species or threatened environments;
- does not contribute to excessive waste in its use or packaging;
- does not rely on unnecessary use of or cruelty to animals.

Other favorable attributes from the green point of view are the incorporation of recycled materials into the product and the product's own recyclability. For example, Samsung Electronics' products have been recognized for their eco-friendly design and technology, achieving eco-labels in many markets around the world. Below are some examples of Samsung's eco-labeled products.

Figure 1. Samsung's eco-labeled products [3].

Secondly, it is necessary to define what stands for ecological pricing. On the one hand greener pricing decisions are based on the premise that goods and services associated with greater environmental damage should cost more. But on the other hand ecological products cost more. Several recent studies indicate that people are willing to pay up for environmentally friendly products and services:

- an IBM survey reveals that the majority of consumers in developed nations are willing to pay more for eco-friendly energy;
- a study by Accenture indicates that nearly two-thirds of people would be willing to pay a premium for products and services that produce lower greenhouse gas emissions;
- A Wells Fargo/Gallup Small Business Index poll found that 43% of business owners believed their customers would be willing to share the added cost of being environmentally friendly. Two-thirds of the business owners said that they would pay more for environmentally friendly goods and services for their businesses [4].

As a result, we can make a conclusion that customers are ready to pay more for green products.

Thirdly, we should analyze green promotion as part of ecological marketing. Perhaps no area of green marketing has received as much attention as promotion. Most buyers are influenced by advertisement that reflects a company's commitment to environment [5].

Companies that do green advertisement that tend to portray an image of environmental friendliness, influences their customer purchase decisions. Consumers love to associate themselves with companies that are environmental stewards. When a company communicates this through their advertisements,

promotions, publicity and corporate social responsibilities, they are sure to get many loyal customers.

Figure 2. Advertisement of ecological products

Green promotion is a great tool which can be used efficiently by ecological companies. Environmental certification or labeling programs attempt to increase consumer awareness and knowledge of environmental issues. Marketers use eco-labels to convey information about a product's environmental benefits and to differentiate among competing products.

While green marketing is growing greatly as increasing numbers of consumers are willing to back their environmental consciousnesses with their dollars, it can be dangerous. The public tends to be skeptical of green claims to begin with and companies can seriously damage their brands and their sales if a green claim is discovered to be false or contradicted by a company's other products or practices. Green marketing can be a very powerful marketing strategy though when it's done right.

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SUMY REGIONAL BICYCLE MOVEMENT

Serhii Maliuk
Sumy municipal charity fund
"Za Chyste Misto" ("For Clean City"), Ukraine

Today all over the world much attention is paid to development of bicycle traffic not only as sport, but also as means of transport in the modern city. First of all it gives purity of environment, and as a result – improving of health of the population. Sumy city must also be convenient for moving by bicycle, but under conditions of infrastructure, which was established in the Soviet period, solving of this problem is not an easy task; moreover the problem of bicycle safety control is quite important. It must be solved in such a way, that bicyclists should become the third full members of the road traffic.

Road traffic accidents have become, for instance, the main reason of death of young people of 15-29 years. All over the world more than 85 % of deaths at the road fall on the countries with low and average income level. Almost a half of fatal accidents happen with the participation of pedestrians and bicyclists. Millions of people become disabled for life. Road accidents occupy much necessary resources of health service, usage of which is required for solving of other problems in the society. If the measures concerning road traffic injures are not taken by 2020, number of road accidents will increase over 65 % according to the forecast of experts. That is why the United Nations Organization has declared Road Safety Action Decade 2011-2020.

We want to perform system steps, which lie in formation of the safest routes to the central part of the city from all city districts, which will help Sumy recreational athletes to move safe along the streets of region centre using ecologically clean means of transport – bicycle.

In January 2012 working group for development and application of program "Dva Kolesa" (**"Two Wheels"**) was created in Sumy. It is made up of Sumy municipal charity fund "Za Chyste Misto" (**"For Clean City"**), represented by head ***Serhii Maliuk***, Sumy regional foundation **"Association of Red Cross of Ukraine"**, represented by chief ***Ihor Shapoval***, social organization **"Initiative Forum of Sumy region"**, represented by chairman of board ***Anatolii Radchenko***, active participant of bicycle traffic, resident of Sumy city – ***Viacheslav Mykhailyk***.

At the first stage of work the tasks were discussed and the field of work was determined on the website of fund "Za Chyste Misto" ("For Clean City") and on the municipal bicycle internet forum. As a result of such work we suggested for discussion four really possible bicycle routes. The presentation of these ideas was carried out at the press conference of the press centre "Sumynews" on 01.03.2012. It is made as a sketch-map of the city with routes, plotted on it. In the process of their preparation we have taken into account the information about road accidents, provided by Municipal Administration of the State Automobile Inspection, a

representative of which took part in the press conference. Besides, we considered peculiarities of Sumy streets with their wide pavements and so-called "parking bays" for traffic in the process of preparation of safe routes. On 12.03.2012 in the studio of Sumy regional state television and radio broadcasting company live program took place with participation of working group for development and application of program "Two Wheels". Today the opinion poll is held within citizen, concerning necessity of realization of this program. It is held by Sumy municipal charity fund "Za Chyste Misto" ("For Clean City") and Sumy regional organization "Association of Red Cross of Ukraine".

In fact, such understanding in the problems of environment protection can be traced in the joint activity not for the first time. For instance – carrying out of "round table" on December 23, 2011 in Sumy press club, concerning "Traffic Load and Ecological State of Air in Sumy". Moreover, the National Associations of Red Cross and Half Moon were recognized as partners in Traffic Safety Improving Resolution (UN Resolution 64/255), adopted by United Nations Organization in March 2010. Discussion of creation of bicycle paths continues on bicycle forum in Internet. In perspective, we are going to create long-term program and to propose it for consideration in the Municipal Council. Cost carry for this program can be performed according to the approach of joint participation of interested organizations. As the pilot project out working group suggests creation of reversible bicycle path at Kurskyi Avenue on the straightway 3 km long, starting from entry to the city to the bridge crossing railway lines. Route traffic is supposed to be without drive on the roadway. After consulting at engineering company and approximate calculation of expenses with traffic experts the required sum amounts to 1 million 40 thousand UAH by estimate.

Critical moment begins – involvement of municipal authorities, charity, social, commercial organizations, international institutes in economic expenses for solving of ecological problems of the city.

The targets are proved: purity of environment, health of citizens, traffic safety, road amenity, uniqueness of future project, and, due to compactness of municipal design, possibility to loop all bicycle routes.

It is high time to make European choice!

ECOLOGICAL AND ECONOMIC OPTIMIZATION OF INVESTMENT ATTRACTIVENESS IN REGIONAL AGRICULTURE WITHIN SUSTAINABLE DEVELOPMENT FRAMEWORK

I.S. Marekha
Sumy State University, Ukraine

The sources of risk in agriculture are numerous and diverse. These range from events related to climate and weather conditions to animal diseases; from

changes in agricultural commodities prices to changes in fertilizer and other input prices; and from financial uncertainties to policy and regulatory risks. But there is still one environmental factor that can be served as a huge producer of risks, especially for investors which behavior and decision-making profile are of special concern from our point of view. Such environmental factor as irrational use of land recourses on the regional level generates additional risks for investors and reduces investment attractiveness of regional agriculture what is negatively reflected on its sustainable development because of lack of financing. In these conditions, the optimal choice of investment strategies to cope with such risks is of crucial importance.

We propose to optimize investors' choice in regional agriculture through making efficient portfolios which are all would have been adjusted for ecological factor for attaining sustainability in agriculture in such a way (Table 1).

Finally, it is important to point out that reaching toward the goal of sustainable agriculture is the responsibility of all participants in the system, including farmers, labourers, policymakers, researchers, retailers, and investors.

Table 1 – Ecological and Economic Optimization of Investment Attractiveness in Regional Agriculture

Ecological and economic indicators of investment quality	Agricultural crops (objects for investments)															
	wheat	barley	corn	sunflower	wheat	barley	corn	sunflower	wheat	barley	corn	sunflower	wheat	barley	corn	sunflower
Optimal investment structure adjusted for ecological factor	0,19	0,28	0,39	0,14	0,22	0,20	0,17	0,41	0,28	0,24	0,46	0,02	0,21	0,33	0,38	0,08
Portfolio investment risk adjusted for ecological factor	26,81				58,62				3,08				1,12			
Portfolio return adjusted for ecological factor	343,36				474,58				442,01				49,52			
Investment strategy	governmental				banking				self-investment				foreign investor			

ECOLOGY AND DISTRIBUTION OF RARE MAMMAL SPECIES IN THE SOUTH REGIONS OF UKRAINE (ON THE EXAMPLE OF THE WOLF)

Vita Matvienko
Tavria State Agrotechnological University
Melitopol,Ukraine
Research supervisor: prof. A. Volokh
Language advisor: Yu. Polikarpova

The objective of the article is to analyse the biotope allocation and specifics of the wolf reproduction in the south regions of Ukraine.

Present populations of the wolf in the steppe zone of Ukraine started their formation in the 1970s. At first, it was caused by reduction of hunting press, and later by appearance of a high number of fields overgrown with weed. Penetration of the wolf into the south of the country went from different directions. In the west groups of great importance were the wolves, survived on the territory of Moldova Republic and in the north of Odesaregion; in the north it was at the expense of the population inhabiting the forest zone; in the east there were centres of the wolf habitations, located in forests of the Syverskyi Donets River and in borderline districts of Russia. By 2000 the wolf had inhabited all the administrative regions of the steppe Ukraine. In 1984 the appearance of this animal was recorded on Kerch Peninsula in the Crimea, although its basic expansion to this area began in the first years of the 21st century (Fig. 1).

Figure 1. Dynamics of the wolf range in the steppe zone of Ukraine:1 – sites ofthe speciesdistributionin the early 1970s, 2 – sites of indigenous distribution of the wolf; 3 – records of animals in 1962 – 2009

The most suitable biotopes for this species in the studied region are sunflower plantations, tall weeds and the gullies overgrown with trees and shrubs, although quite often these animals can be seen in the fields deprived of vegetation (Fig. 2).

In the steppe zone of Ukraine to make a dwelling for their litter wolves predominantly use holes (51.62%), then open dens (25.81%) and specially digged burrows (16.13 %). Most often in flat areas of the steppe zone wolves make dens for cubs in forest belts and blackthorn bushes, whereas in broken terrain they made them in gullies. The average size of the wolf litter in the steppe zone of Ukraine is 5.5±0.13, the smallest – 2, the largest – 12 cubs. Regional differences of this index are insignificant. The smallest number of cubs in 1 den was revealed in Odesa region (5.0±0.16), the highest – in Lugansk region (6.5±0.37).

The species expansion and increase in the number of local populations was caused by reduced hunting pressure as well as appearance of a high number of fields covered with ruderal vegetation. Nowadays the wolf inhabits territories of all the administrative regions of the steppe zone and actively occupies the Crimean Peninsula where it was extinct since 1928. Another dispersion of the wolf into the steppe zone of Ukraine started in the 1970s and reached its peak in the beginning of the 21st century.

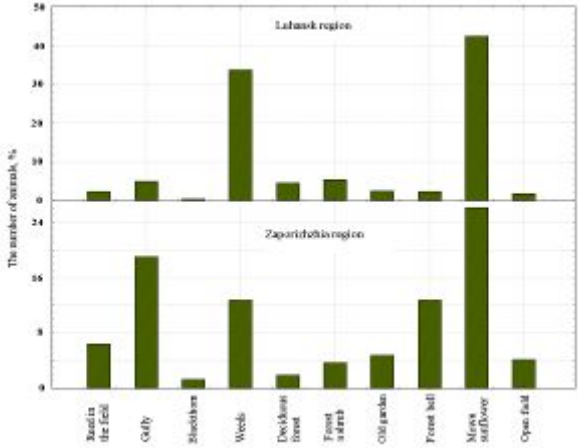


Figure 2. Autumn-winter distribution of the wolf on biotopes in the north (Luhansk region; n = 478) and in the south (Zaporizhzhia region; n = 163) of the steppe zone

The conclusion can be made that in transformed steppe ecosystems the wolf populations requires management of their number and spatial distribution. It will allow limiting further growth of their quantity as well as save some centres of its distribution.

BOEING DREAMLINER: THE PROMISE OF GREENER FLYING

Slim Mbarak Omar
V.N. Karazin Kharkiv National University

The Boeing Dreamliner promises to be one of the least polluting aircraft ever used for commercial flights, and should go some way to answer criticisms of aviation's environmental record. Mark Rowe reports.

The Dreamliner represents a continuing trend towards lower carbon emissions

The Boeing Dreamliner 787, which made its first commercial flight in 2010 with All Nippon Airways, has changed air travel in more ways than one. Not only has it offer passengers greater comfort, but it has also be among the least polluting aircraft ever to enter commercial operation.

The new plane has be quieter and use 20 per cent less fuel than aircraft of equivalent size, thanks to greater engine efficiency, the use of lighter composite materials and improved aerodynamics.

To a certain extent, the Dreamliner – the first test flight was in December, 2009 – is the aviation industry's response to its portrayal by many green campaigners as one of the bad boys of the global warming story. It also represents a continuing trend towards lower carbon emissions. According to the International Air Transport Association (IATA), aircraft today are about 65 per cent more fuel-efficient than they were in 1970, while the clean technology of modern engines has almost eliminated emissions of carbon monoxide and hydrocarbons.

The Dreamliner follows in the lower-carbon contrails of the Airbus A380 "super jumbo", which was launched in 2007. When full – typically with about 470 seats – the A380 burns 17 per cent less fuel per seat than other large aircraft and

produces only 75g of CO2 per passenger per km (most cars produce at least 130g and the Boeing 747 around 101g of CO2 per passenger per km). It also produces 75 per cent less noise than its current Boeing rivals.

The urge for more efficient aircraft is driven partly by the desire to control fluctuating high fuel costs and also by the fact that a commercially viable biofuel that can entirely replace kerosene remains a distant prospect. But while IATA has set 2050 as the year by which it wants to see a carbon-free aircraft flying commercially, it does expect to certify an as yet unspecified biofuel for use in kerosene blends in commercial flights this year.

A consortium including Boeing, Virgin Atlantic and Air New Zealand is testing a blend of jatropha (a scrub plant), camelina (a plant from the same family as oilseed rape) and algae. Scaling up production is the issue: the area that would be set aside to cultivate the algae required to meet global annual fuel consumption has been placed at around 27,000sq miles, more or less the size of Ireland.

Ethanol has been discounted because it is low-energy. Liquid hydrogen has been ruled out in the medium term partly because the industry considers that the cost of retro-fitting aircraft and infrastructure would be prohibitive. However, Airbus had suggested that hydrogen may have a role in the longer term and Boeing has flown a hydrogen-powered two-seat motor-glider up to 3,300 ft (1,000 metres) for 20 minutes – though the co-pilot seat had to be removed to create storage space.

Scandinavian Airlines Systems (SAS) has developed a Green Landings programme that significantly reduces fuel burn. Peter Larsson, an SAS captain involved in the project, admits to being irked by those who pillory the aviation industry's environmental record. "We contribute two to three per cent to global carbon emissions, but the public perception is that our contribution is nearer to 20 per cent," he said. "That is frustrating. It means many people think that flying will give them a bad conscience.

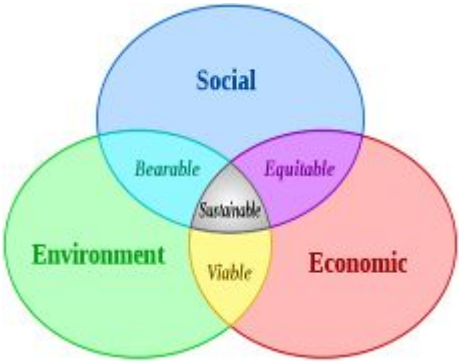
"Aviation is unfairly perceived, but that's not an excuse to do nothing. We have to deal with the equipment we have today. We have to make things more efficient, and this will evolve as it has with cars. We will blend in biofuels and gradually progress to only biofuel. If we want to continue to live the way we do, I don't see a world without flying." While technologist and environment get better from some aero plane which come in modern way of preventing environment.

THE SUSTAINABILITY OF ECOLOGICAL ECONOMICS AND POLICY MANAGEMENT IN DODOMA REGION, TANZANIA

Ahmed Mbaraka
Kharkov National University of Radioelectonic

Ecological economic is a transdisciplinary field of academic research that aims to address the inter dependence and co-evolution of human economies and

natural ecosystems over time, nature and space. It is distinguished from environm ental economics, which is the mainstream of economic analysis of the environment by its treatment of the economy as a subsystem of the ecosystem and its emphasis upon preserve natural resource, long-term outcomes, and sustainable development.



Ecological economics includes the study of the metabolism of society, that is, the study of the flows of energy and materials that enter and exit the economic system. This subfield may also be referred to as biophysical economics, bioeconomics, and has links with the applied science of industrial symbiosis.

Ecological economics is based on a conceptual model of the economy connected to, and sustained by, a flow of energy, materials, and ecosystem services, Analysts from a variety of disciplines have conducted research on the economy-environment relationship, with concern for energy and material flows and sustainability, environmental quality, and economic development.

Nature and Ecology: A simple circular flow of income diagram is replaced in ecological economics by a more complex flow diagram reflecting the input of solar energy, which sustains natural inputs and environmental services which are then used as units of production, Once consumed, natural inputs pass out of the economy as pollution and waste. The potential of an environment to provide services and materials is referred to as an "environment's source function", and this function is depleted as resources which consumed or pollution contaminates the resources.

Policy and Regulatory framework for Dodoma environment.

Environment and natural resources management have been mainstreamed in the Tanzanian National Strategy for Growth and Reduction of Poverty (NSGRP). 14% of the targets in the strategy relate to environment and natural resources management and there are a considerable number of environmental interventions under non-environment targets.

Over the past 45 years, Tanzania environmental policy careers have tracked the environmental movement generally. Early efforts were targeted at conservation and preservation, which then grew into the pollution regulation and mitigation focus of the 1970's through the mid-1990's. Today's environmental managers and policy makers are focused on pollution prevention and integration of environmental considerations into economic and social decision-making.

Population and economic growth pressures are creating complex environmental problems that directly impact all aspects of human society. Sustainable development, once the cutting edge of environmental issues, is now

expanding to incorporate education, governance and democracy, poverty reduction, public health, security, and economic strategy along with traditional environmental fields of agriculture, natural resource management, pollution abatement and conservation.

For example, waste management cannot be addressed with simply landfill policies, but must incorporate smart growth, recycling, emission capture, and creation of markets to turn waste into a useful commodity.

Challenges for today's international environmental policy analysts include: controlling global climate change, considering environmental regulations in treaties and trade agreements, creating environmentally and economically sustainable development, and helping the private sector find ways to incorporate environmental concerns into business planning. In much of the world, basic environmental management such as water resources, wetlands protection and restoration, and environmental health are also very important developments as economic progress puts stress on existing systems.

Career-related activities within this field include Dodma policy and scientific research, environmental education and advocacy, regulatory and legislative design, technical assistance to government agencies for planning and management, regulatory compliance and enforcement, and entrepreneurial development in environmental products and service.

Ethics and safe energy source of Modern world

Biofuels • Biomass • Geothermal • Hydro power • Solar power • Tidal power • Wave power • Wind power etc Mainstream economics has attempted to become a value-free 'hard science', but ecological economists argue that value-free economics is generally not realistic. Ecological economics is more willing to entertain alternative conceptions of utility, efficiency, and cost-benefits such as positional analysis or multi-criteria analysis. Ecological economics is typically viewed as economic for sustainable development, and may have goals similar to green politics.

Methodology - A primary objective of ecological economics (EE) is to ground economic thinking and practice in physical reality, especially in the laws of physics (particularly the laws of thermodynamics) and in knowledge of biological systems. It accepts as a goal the improvement of human well-being through development, and seeks to ensure achievement of this through planning for the sustainable development of ecosystems and societies.

THE DUALISM OF ECONOMIC SYSTEMS AND ENVIRONMENTAL ISSUES

Leonid Melnyk
Sumy State University, Ukraine

Physicists know the so-called effect of dualism, when particles at the same time exhibit properties both of discreteness and field (photon wave) (Фейнман, 2004). But if certain effects are inherent in the microworld, do they work as well at the macro level – at the level of economic systems? In particular, do economic agents show qualities similar to properties of discrete particles and fields? Most likely, we can say yes to that, to some extent any part of any system, including economic has the property similar in its manifestation to dualism.

The phenomenon of dualism lies in the fact that a particular element has both properties: a) *discrete unit (corpuscle)*, which coordinates can be uniquely determined in space and time as a certain point, and b) *field-essence*, which has a substantial length in space and duration in time.

Economic systems exhibit their field properties in space and time:

- *in space* as medium of economic relations: first, with *suppliers* of inputs, and secondly, with *consumers* of goods, thirdly, with *state* that provides social services and fourth, with *population* of the concrete territory (administrative region) delegating the right to dispose public (natural and infrastructure) assets of the area elected to the local authority and administration; fifth, with a variety of *competitors* (for resources, for potential customers, with the possibility of using limited natural resources and infrastructure), *sixth* with *lower-level structures* (subsidiaries and conjugated enterprises);
- *in time* as subjects, which are the subjects of cause-effect relationships: first, as a result of the events that took place *in the past* (being the carrier of heredity, and history of their predecessors), and secondly, as a source (cause) of events extended *in the future*.

For example, we can say that every company creates prerequisites for the operation, respectively, resource providers and consumers of their goods.

The automobile industry development in the United States is an excellent illustration. The car (assuming the specific company for its production) has created infrastructure, related products, life style of America, provided the development of petrochemical industry, road construction, tanker fleet, cars service, training drivers for road police control and nowadays satellite navigation, and many other things.

Economic research of 1960-1970 allowed "see" another facet of the virtual images of the field nature of economic agents. A new economic concept – "externalities» became to be used in everyday life (Classics, 1997, Markandya, 2002). Non formalized effects of businesses that are not "captured" by the official

(documented) system of economic accounting businesses that they have produced are called so. More often externalities are understood as environmental impacts. In principle they can be any results that are perceived by other economic agents from the activities of enterprise (Bithas, 2011, Van den Bergh, 2010, The Economics, 2011).

Thus, each company creates a unique information-energy field. Directing capital flows of different degrees of power in different areas (sectors) of activity (eg, resource production, or use of goods), this field is the source of a specific quasi-energy of companies. And this energy is in a certain way directed and concentrated by the information. The mentioned above gives grounds to speak about the information vector of the energy field. The field spreads in space and extends in time. As we have seen, this field can have both negative and positive value, bringing destructive effects or additional benefits of economic and informational forms to other businesses (for example, in the form of increased costs, damages, lost profits).

The role of economic dualism in the evolution of economic systems. The formation of quasi-energy field is a prerequisite for creating variability in the possible change in economies state. Each of the virtual variants of development options for economic systems evolution must pass natural selection, proving its worth in terms of efficiency and the ability to reduce the production of entropy. In his Nobel speech, and a number of publications, Nobel Prize winner Werner Arber has suggested a genetic dualism which manifests itself at the level of biological organisms. In particular, the genetic mechanism is responsible for not only life and development of each individual biological organism, but also the evolution of the entire population to which it belongs (Arber, 2000). Similar processes occur at the level of economic systems development, which content and form are determined by the mechanism of evolutionary triad (heredity-variation-selection) operating in tough competition.

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SYNERGETIC EFFECTS OF INNOVATION MARKETING

Leonid Melnyk, Iryna Dehtyarova
Sumy State University, Ukraine

Modern economic development is impossible without innovative marketing decisions. A successfully formed system of innovative marketing measures provides survival of enterprises under difficult globalization competition.

The most widespread forms of innovative marketing are: invention patents; patent licensing; unlicensed inventions trading; technical documentation transfer; "know-how" transfer; technological knowledge transfer, which is needed for acquisition or equipment and machines leasing; informative exchange during personal meeting; engineering; realization of general research and development; organization of joint production and ventures. In industrially developed countries marketing firm development conception occupies an honoured place for more than decades.

Strategic innovative marketing is determined by market segmentation, positioning of goods and services. The key moment of marketing strategy is research and prognostication of demand for a new good, perception based on a thorough study of consumer perception of innovation.

The primary task of division of marketing on initial stage of innovative strategy is market research. As a rule on the initial stage of such research, general economic analysis is conducted. This type of analysis is closely related to the study of "external environment" of enterprise (e.g. population, growth rates, profit per capita and consumption, cost-of-living-index, "consumer basket", inflation and other rates) and allows investigating macroeconomic factors which relate to demand for innovations.

Conception of innovation marketing is the basis for market research and search for competition strategy of enterprise. Introduction of innovation marketing makes sense when synergetic effect is considerably higher than those economic subjects had before introduction of innovative marketing decisions. They can, for example, tackle the expansion of market segments, introduction of new methods of goods use, entering new markets (raw material markets, sale markets, etc.); development and realization of new goods and services; diversification of

production and sale. It is possible to expect synergetic effects in two different directions: 1) synergetic effects which show up within the limits of one enterprise from systemic application of different marketing instruments; 2) synergetic effects, which show up from systemic activity of separate enterprises which unite for achievement of certain economic goals.

To get a positive synergetic effect of the first type, namely from systemic application of marketing innovations is possible in the cases of sale activity optimization, marketing planning optimization, marketing researches optimization, advancement of goods to consumers optimization, use of informative marketing systems optimization and advertising optimization.

As a result a synergetic effect of innovation marketing can appear. It is expressed in the effect of complex application of innovative marketing decisions and it differs from simple addition of effects of every separate measure:

$$E_i \geq E_1 + E_2 + E_3 + E_4 + E_5 + E_6 \qquad (1)$$

where *Ei* is an effect of integrated innovations marketing;

E_1 - sale optimization;

E_2 - marketing optimization;

E3 - marketing research optimization*;*

E4- optimization of goods advancement to consumers;

E5 - optimization of informative marketing systems use;

E6 - advertising optimization

Application of the mentioned approach is especially important for advancement of ecological goods and services to the market.

Synergetic effects of marketing innovations, which appear from common activity of separate enterprises, can be realized due to basic groups of factors: efficient use of marketing; costs minimization; increase of firm's value; innovation approach to forming marketing policy; increase of competitive advantage (Fig. 1).

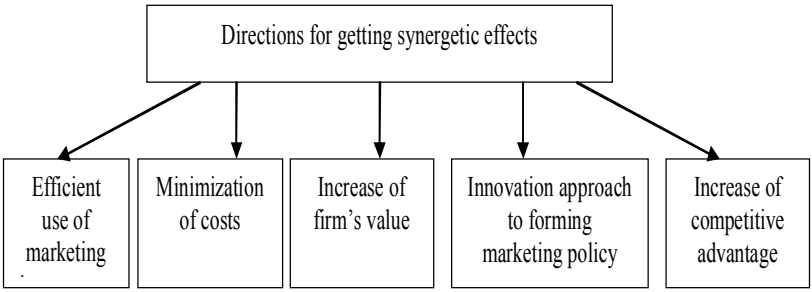


Figure 1. Synergetic effects of innovation marketing from systemic activity of separate enterprises

As a result of positive synergetic effects the increase of investment attractiveness can be possible and it can provide capital flow increase, improvement of management and assets value increase.

ECOLOGICAL TOURISM AS A NEW COMPETITIVE CLUSTER OF RUSSIAN SERVICES MARKET

Alexander Mokhov
Kursk State University, Russia

Concerning to Michael Porter's "The Competitive Advantage of Nations" cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters have the potential to affect competition in three ways: by increasing the productivity of the companies in the cluster, by driving innovation in the field, and by stimulating new businesses in the field. All of those ways can be easily developed, when attention is paid to the cluster of ecological tourism.

The nature of Russia provides great potential opportunities for development of ecological tourism. In Russia areas with traditional, native, the farm patterns, representing big ecologo-cultural value remained. However, despite extensiveness of the undeveloped or poorly mastered spaces, a state of nature in Russia as a whole it is far not safely.

Unfortunately, in Russia out-of-date technologies, and not only in the industry, but also in rural and forestry are used generally. Besides, serious restriction for development of ecotourism is high sensitivity of many ecosystems of Russia to anthropogenesis influences, their fragility, and just in the areas attractive by the wild nature or native farm patterns.

And still development of ecological tourism in Russia not only is possible, but also it is necessary. For many regions of the country it is the unique solution of a problem which for many years seemed insoluble: how to combine interests of the person and the nature, without having caused a damage of any of the parties. Ecological tourism offers the unique decision which will provide workplaces and stably high income of the population and will keep the wild nature of Russia in inviolability.

Today in the world tourist market there is a serious competition, and to enter into this market very difficult. There are the specifics and the difficulties.

Our cold widths of an ecosystem in principle can't possess that efficiency which is characteristic for tropics, i.e. we can't offer the spoiled tourists of an effective show of a large number of large wild animals. The million herds of hoofed animals shaking imagination of visitors of the African national parks, at us are simply impossible. Besides a taiga – not the savanna where the elephant or a

giraffe are visible for kilometers, and experience of communication with the person at the Russian wild beasts still was too sad that tigers or bisons left to pose before cameras. It limits at once quantity wishing to visit our edges.

Serious scientific study of routes, technology of cleaning of routes from the household waste which emergence is inevitable is necessary. When planning routes it is necessary to consider not only interest of tourists, but also ability of a site of the nature to pass through itself a certain number of people, work of specialized scientific institutions is necessary. Who will be engaged in it, not absolutely clearly. In any case, to usual travel agency similar work obviously not under force.

As we see, there are a lot of problems, but they in principle are decided and that is pleasant, the first steps in this direction are already made.

Preparation of the qualified experts for work in the field of ecological tourism begins. However, on this profile while it is a little educational institutions, but after all they are – for example faculty of ecological tourism of the Russian Academy of tourism and office of management and service of the international ecological tourism of the International independent ecologo-politological university. Here prepare managers and economists of ecological tourism for work in travel agencies, reserves, nature protection zones, national parks, educational institutions, hotels, camp sites.

In ecological tourism allocate many directions as different authors choose various criteria for classification. Depending on a main objective of round allocate: supervision and studying of the wild or cultivated nature with receiving bases of ecological knowledge; rest in a nature environment with the emotional, esthetic purposes; treatment by natural factors; sports and adventures.

On the main object defining the contents of the program of round and partly a form of its organization, ecological trips subdivide on: botanical, zoological, geological; ecologo-ethnographic, archaeological and in general ecologo-cultural rounds; agrorounds or rural green rounds; speleological, water, mountain rounds, etc.

At last, all variety of types of ecotourism can be divided into ecotourism in borders of especially protected natural territories and out of them. It is clear that all similar divisions are rather conditional, but they at least provide guidance on volume interests and ecotourism possibilities however are various.

In conclusion can be said that Russia, with its richest natural and cultural heritage, a regional variety of traditional forms of environmental management potentially is one of the most attractive countries for world ecological tourism.

SUSTAINABLE DEVELOPMENT AND SECURITY PROBLEMS

Viona Mukeira
Kharkov National University of Radioelectonic

Institute of World Economy and International Relations of the National Academy of Sciences of Ukraine Recognition of necessity in transition to sustainable development and implementation of a such development model provide for cardinal reconsideration of the national and global security priorities. The concept of the transition to sustainable development may not be separated from that of ensuring the national and global security. In case of traditional development characterised as implementation of a unsustainable development model the national security can not be ensured in principle. In other words, the national security can be ensured only under sustainable development conditions. Thus, any strategy designed to ensure national, first of all environmental security, must be derived from the principles of sustainable development.

This is a essential new approach to the security and safety problems, since previously security has been considered as protection against threats emerging in the process of naturalistic development (within the framework of the unsustainable development model). Nowadays, only those states and societies may be recognised as secured ones, which follow the principles deriving from the sustainable development model while unsecured states and societies may be characterised as those following the unsustainable development model leading the mankind to a global catastrophe.

By the present moment a lot of countries have established the priorities of solving social and economical problems in their national security strategies. But the current conditions call for incorporating the fundamental ideas of global sustainable development of society and nature into a national security concept. Due to the strategy of sustainable development and environmental security a general concept of national security gains a new, global and biospherical dimension making its contribution to our civilisation survival and preservation.

Thus sustainable development is not only a systematic integrity of the economical, social and environmental activities of different types, but also the immanent interdependency of development and security.

The preservation of biosphere is a basis of society sustainable development. But the transient to the model of sustainable development in itself is necessary to ensuring security and sustainability of biosphere development. Society and biosphere determine each other in their development. It seems to be obvious that the security of society, a nation, and a person can not be ensured if biosphere with its biological variety of species, sustainability of natural cycles and processes of evolution is damaged. In terms of a security concept it should be noted that the anthropocentrism in this field has remote past roots, and the particularly social approach to solve this problem is replacing with the socio-natural one. Along with

traditional objects to be secured – state, society and a person - a new natural object closely associated with them, biosphere, has been emerged.

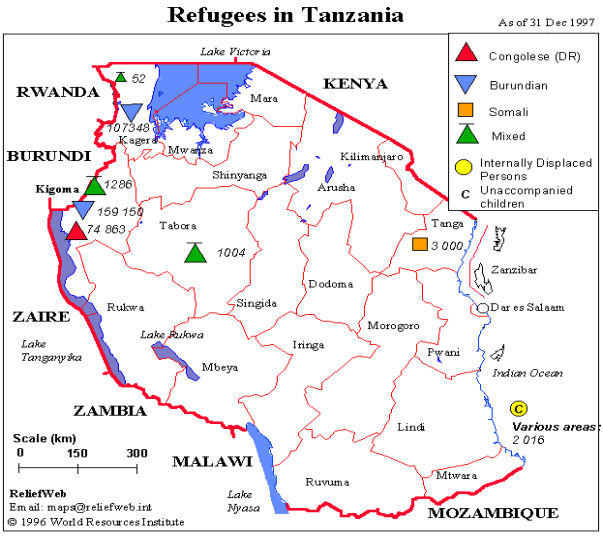
Deriving from the necessity to turn to the sustainable development model it is expedient to add "The Concept of National Security of Ukraine" with the new approaches to ensuring military, economical and environmental security and safety issues. When doing so it is important: to review the existing and potential internal threats to national security; to develop measures aiming at reaching the necessary

parameters of economical development and environmental conditions; to identify

the characteristics of national economy and environment being adequate to the national security level required and providing sustainable development, normal operation of the vital branches of industry and social sphere; and to improve the living standards of public also affecting sustainable development.

THE IMPACT OF WOODLAND OF REFUGEE CAMP TO ENVIRONMENT IN WESTERN TANZANIA CASE STUDY OF MTENDELI CAMP AND THE VILLAGES OF KASANDA IN KIBONDO DISTRICT

Magere J. Mwendwa
Kharkiv N. Univesity of Radioelectronic



Tanzania had experienced a number of environmental problems caused by economic activities, such as overgrazing, shifting cultivation, illegal logging, ovecultivation, pollution etc.

Currently the country experiencing number of environmental degradation causes by influx of refugee as economic source from UNHCR in Tanzania,

This situation has caused environmental degradation and shortage of resources for local communities and refugees, Such destruction of natural resources may

lead to the extinction of certain flora and fauna species to disapear, which are of importance for local communities, such as medicine plants, wild animals edible insects, edible fruits etc.

The situation is getting worse when the limited existing resources are shared between refugees and local communities. As a result conflict arises between the groups over the use of resources.

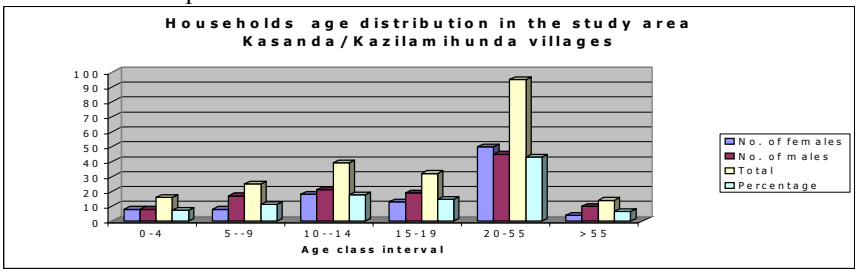
Aims and objectives of study environmental care.

- This aimed to accessing the impact on woodland as resources shared between refugees and local communities in Mtendeli refugee's camp and the surrounding villages of Kasanda.
- To compare the extent of damage resulting from over use of the resources.
- To evaluate the conservation efforts and rehabilitaion programmes carried out in the past and present in the area.

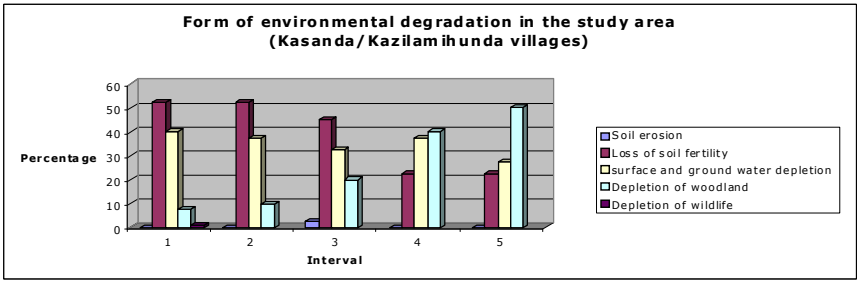
Study area, environmental destruction and economic activities.

- Mtendeli camp and the villages of Kasanda, where economic activities and environment covered severe destructed due to mass refugees;
- The Kasanda village are overpopulated and conducted black market which destruct local and regional economics activities as well as environment;
- The population size of the areas; Mtendeli range from 50,000-30,000; Kasanda 10,275 and 3,575 while service and land capacity is small to carry such amount of people.

Results of Household performance



This are form of environmental degradation in the study area



What is the impact of resources use and sharing in the area?

The influx of the refuges and natural growth, establishment of refugee's camp within the forest reserve area and much closed to local community, widespread of poverty in the area and lack of alternative means of livelihood for both refugees and local community creates conflict of resources use and sharing in the area. This conflict was because of the depletion of the resources (water, wild animals and fuel wood) in the area.

What is the damage caused by resources use and sharing?

- ✓ Depletion of forest in surrounding area which provides fuel wood and timber for both local community and the nation.
- ✓ Degradation of forest designated areas for religious, customs and spiritual which were used by local communities for worship.
- ✓ Destruction of woodland (catchments) in the camp resulted to decrease of water flow into downstream river and source of water.

Rehabilitation, Recommendation and Conservation efforts

- Establishment of the trees nurseries and planting of trees in degraded areas in the camp and surrounding villages, Natural forest protection and natural vegetation conservation.
- Environmental education, training and awareness rising by introduced and use of improved stove to reduce the amount of firewood used by refugees and local communities with the aim to protecting environment.
- There is need enforcement of laws and by laws in the area to stop refugees being involved in any production activities which increase the pressure of environmental degradation;

EUROPEAN EXPERIENCE OF ECOLOGICAL TAXES REFORM

Larisa Nekrasenko
Poltava State Agrarian Academy, Poltava, Ukraine

Currently Greenhouse Gas Emissions are the main reason of the threat of global warming. The introduction of Ecological Taxes Reform can become a powerful instrument to solve many environmental problems. Therefore the tax policy of the state must be concerted with the environmental policy. Taxes must realize basic priorities of the state - to provide a human right on a healthy environment which is constantly violated in the conditions of market economy.

As European experience testifies, green taxes are regarded as an effective economic instrument for the improvement of the state of environment. Many economists have long been regarding eco-taxation as a possible solution of many environmental problems. Sweden's Carbon Tax is one of the a few examples of such a taxation scheme in actual use.

For today in Ukraine the ecological taxation not spared the proper attention. The general level of tax collections on contamination does not reach 1% of GDP.

The questions concerning adjusting of economic instruments of defence of environment in Ukraine are unsolved.

Sweden was one of the first country which introduced an Environmental Tax - tax on carbon. Carbon dioxide being a known greenhouse gas, in excessive quantities has been shown to cause a warming of the earth's surface by trapping solar heat within the earth's atmosphere. In response to this threat, Sweden signed the Rio Declaration. This declaration committed Sweden to stabilizing its carbon dioxide emissions at its 1990 level and there for on January 1, 1991, the Swedish Environmental Tax was enacted.

Sweden is one of few highly developed countries of the world, which managed to shorten Greenhouse Gas Emissions. In 2007 Sweden topped the list of countries that did the most to save the planet - for the second year running - according to German environmental group, Germanwatch. Since the imposition of the Environmental Tax, Sweden cut its carbon emissions by 9%, largely exceeding the target set by the Kyoto Protocol, while enjoying economic growth of 44% in fixed prices. Despite economic growth of around 55% between 1990 and 2007, emissions of greenhouse gases have still been able to be reduced. [National Inventory Report 2012 Sweden] It can be hypothesized that emission levels will continue to drop as a result of the increase in the overall tax rate and the reintroduction of the 50% industry rate.

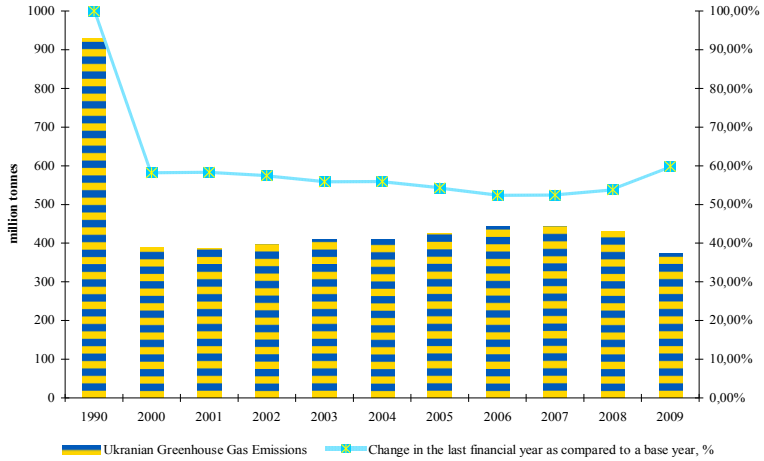
Overall, the Swedish Environmental Tax demonstrates the ability of an eco-taxation system to reduce Greenhouse gas emissions.

In 2010 Ukraine introduced an Environmental Tax and a Carbon Tax in Tax Code. But the tax rate in €0.02/t CO_2 is very-low for fear to lose a competitiveness of power-hungry domestic industry. At the same time a Carbon Tax rate in 40$ per tonne CO_2 is considered reasonable in the industrial developed countries.

In 2010 revenues from Environmental Pollution Fee accounted only 0.18% of GDP. At the same time according to the forecast on 2011 the revenues from Environmental Taxes will decrease and will make 0.07% of GDP and in 2012 – 0.09% of GDP. [A law of Ukraine "On the State budget of Ukraine on 2012"].

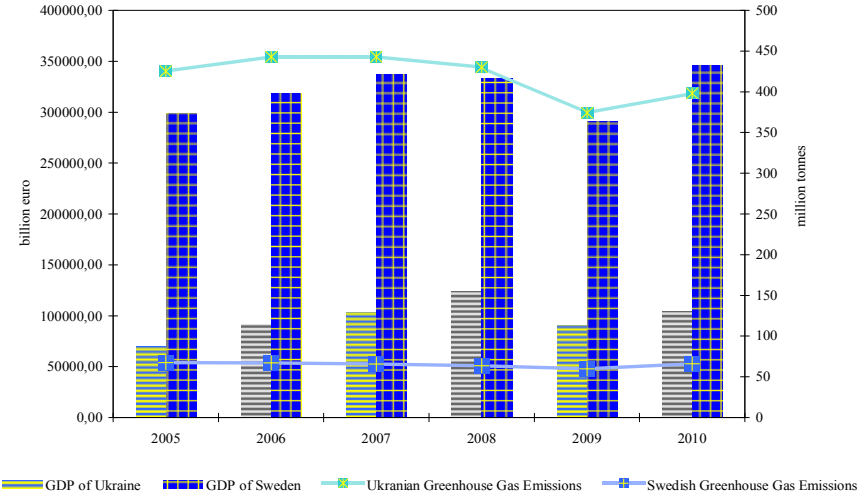
Graph 1 shows the dynamics of Greenhouse Gas Emissions in million tonnes in Ukraine and change in the last financial year as compared to a base year, %. In 2009 Ukranian Greenhouse Gas Emissions decreased by 15.1 million tonnes as compared with 2000 and made 59.5% emissions of 1990, which is a base year according to Kyoto's protocol. It is necessary to mark that the fall-off of greenhouse gases extrass happened not as a result of careful attitude toward an environment, and by reason of disintegration of economy at the 1990. Many enterprises ceased to exist. Remaining shortened production volumes considerably. All of it in a complex formed the picture of decline of extrass.

Over the past ten years dinamik of Greenhouse Gas Emissions shows relative stability of volumes of emissions. There is insignificant decline in 2009 on 10,3 million tonnes. But it is related to the cutback of economic activity as a result of crisis in 2008. This tendency is very well seen on a diagram.



Graph 1. Dynamics of Greenhouse Gas Emissions in million tonnes in Ukraine and change in the last financial year as compared to a base year, %

Source: National Cadastre of antropogenic extrass from sources and absorption of greenhouse gases absorbers in Ukraine in 1990-2009.



Graph 2. Comparison of Greenhouse Gas Emissions and GDP in Ukraine and in Sweden

Source: National Cadastre of antropogenic extrass from sources and absorption of greenhouse gases in Ukraine in 1990-2009; National report about the state of natural environment in Ukraine in 2010; National Inventory Report 2012 Sweden

Graph 2 shows that Greenhouse Gas Emissions in Ukraine more than 6 times exceed Swedish. And GDP is 3.4 times lower than in Sweden. The increase of rates on carbon will not decide this problem. But if to create the system of Environmental Taxes, which will replace the system of labour taxes gradually, then it would become a powerful incentive to high GDP growth.

On the example of Sweden an Environmental Tax demonstrates the ability of an eco-taxation system to reduce air pollution, to increase economy and to develop population ecological consciousness.

The Ukrainian legislation and environmental tax policy need future improvement, especially if to take into account Ukraine's adaptation to the requirements of European Union and fight for climate stabilizing. The necessity of creation of the effective Ecological Taxes System is obvious for replacement of the Labour Taxes System. Only a Carbon Tax can give considerable investment in the budget. In the whole green taxes can become the powerful source of GDP growth

THE PROBLEM OF ECOLOGICAL VALUES INTERIORIZATION IN TALCOTTE PARSONS' PERSONALITY SYSTEM SCHEME

Volodymyr Nochvai
National Academy of State Tax Service of Ukraine, Irpin, Ukraine
Andriy Bondarchuk
State Property Fund of Ukraine, Kyiv Regional Dept., Kyiv, Ukraine

Talcotte Parsons

One of the main problems of successful social implementation of ecologic and economic programs and projects with achieving expected positive results is the socio-psychological problem of individual excepting the values the researchers appeal and try to develop.

Very often, those programs end with the conclusions and theoretical evidences, what should be done and do not answer the question, how or what should be the mechanism of implementing ecological values into social acts or day-to-day human behave.

The concentration of production and population, urbanizatio n took place in industrial society. Values system with orientation on efficiency, rationality, and business optimization etc. without regard to consequences of such values with natural environment needs is formed. Modern society, which attained the high level of scientific and technological cognition and development, is unable to apply this knowledge to the primary world population needs satisfaction.

Thus humanity attained a critical limit, and created the real existence threat. Powerful economic development based on scientific and technical progress appeared to be destructive for biosphere, environmental development level have worsen, natural resources are being exhausted, poverty grows, all spheres of public life degrade, moral values are lost. But exactly morally reasonable and creative human activity should be the main factor of our world sustainable development, with satisfaction of all human needs (material, social, cultural, ethical, ecological, etc.). The essence of sustainable development conception lies in the field of natural recourses rational exploration aimed to biosphere recovering possibilities and normal living conditions for present and future generations. Realization of this approach needs the understanding of human place and role in the system Person- Nature-Society. Ethical norms and principles of individuality with consuming attitude to nature in industrial or post-industrial society should be transformed in terms of eco-systemic and environmental values individual perception process synchronically with social and individual needs and interests forming.

That is why it could be useful to solve the ecological, cultural, economic and social current questions taking into consideration socio-psychological factor – the level of personality. We propose to look on this question from the concept of interiorization in connection with T. Parsons' scheme of Cultural, Social and Personality Systems coordination.

Interiorization *can be defined as the process of individual exception of external (social, cultural, ecological) values, perception them with fixing into the personality system of individual actors.*

This concept is proposed to analyze from the Parsons' Social Act Structure theoretical position.

Parsons' theory declares that a social system is made up of a large number of separate actors interrelating with each other under circumstances that can at least be characterized by physical or environmental features, "actors who are motivated in terms of a tendency to the "optimization of gratification" and whose relation to their situations, including each other, is defined and mediated in terms of a system of culturally structured and shared symbols" (Parsons 1).

Therefore, Parsons' social system is only one third of the whole. Completed system of social interactions is made up of :

- social system;
- personality systems of individual actors;
- cultural system.

Each of the systems is independent and indispensible.

Parsons claimed that social roles are created artificially, through the permanent recurrence of this or that behavioral pattern that is formed under the influence of established or institutionalized expectations. Proposing that individuals can perform several diverse roles simultaneously, he than developed a notion, that roles can balance each other while carrying out expected functions to fit in a social order. As a result, some roles are combined in various social structures and institutional formations, such

as educational, medical, economic or legal establishments. This phenomenon is practically useful, since it allows society to operate efficiently.

So, when programming and implementing ecological programs one should take into consideration the analysis of the mechanism of individual perception and ecological norms or values interiorization.

Thus, it is recommended to provide 3-levels analysis – the mechanism of values interiorizing on social, cultural and individual systems level.

Nowadays, most theoretical and even practical models of economic ecologization are directed to Cultural ("***What*** should be done?"), Social ("***Where*** and sometimes ***How*** should it be done?") System level, although more scientific attention should be paied to the question "***For Whom*** should it be done?" that is the level of Personality System, where the main accent is stressed on the individual or social actor as the object of researches and scientific projects.

Parson viewed social processes as those occurring under well-structured control. Every change in society is provoked by the need for order and clarity of established roles and expectations. Human nature is disposed to fit into a structure. Action scheme of reference, which is primarily concerned with individual's orientation in a given situation, is described by Parsons as "the scheme, that is relative to the units of action and interaction, is a relational scheme. It analyzes the structure and processes of the systems build up by the relations of such units to their situations, including other units" (Parsons 1).

So, in ecological politics it is important to create (to program systemically) such social situations in which individuals would not only somehow relate to the ecological imperatives but also act due to interiorized in their consciousness ecological values, and those co-relations and actions would be on high social priority.

According to Parsons, the process of socialization is significant because it serves as an instrument for transmitting and thrusting the conventional standards and morals of society to the individuals belonging to the system. The process is, moreover, encouraged by the positive and negative reinforcement of role performance that does or does not satisfy generally accepted expectations. If social norms and values are not adjusted to the set roles, and stability is not gained, structure may break up and either die, or transfer into a new system.

Such Social, Cultural and Personality Systems coordination approach with stress on implementing activities on ecologic values interiorization on personal level, due to formed social and individual expectations, should be the main point of view in environmental system and sustainability development programming.

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LOSS OF TROPICAL FOREST AND THE NEED FOR PRESERVATION

Jonathan Emeka Nwosu
Sumy State University, Sumy, Ukraine

Any discussion on plant and animal conservation usually begins with tropical forests because these forests contain at least two-thirds of the world's organisms, which consist of at least 3 million species. Tropical forests today cover about 6 percent of the Earth's land area. The fastest destruction of tropical forests is taking place in Central and South America (especially Brazil), equatorial Africa, and parts of Asia. The forests in these regions of the world also include tropical rain forests—meaning they are dense, heavily wooded forests that grow in areas of high precipitation, receiving 55–160 inches (150–400 cm) of rain per year.

Tropical forests are characterized by a high amount of plant, tree, and animal diversity; dense canopy that lets little light reach below; temperature averages of 68–77°F (20–25°C) that vary little throughout the year; evenly distributed precipitation; and nutrient-poor soil.

CAUSES OF LOST OF TROPICAL FOREST: There are Primary and Secondary causes.

Primary causes, also called basic causes, refer to general conditions within a region's economy and politics that lead to deforestation. These include: poverty, overpopulation, historical factors, government policies, exports to the international market.

Poverty and overpopulation throughout the world, force people to deforest their land; consequently plant and animal biodiversity declines, pollution increases, and climate change upsets ecosystems. Regional history also puts pressure on forested lands, especially in relation to the region's poverty levels. Tropical forests exist mostly in developing countries, except for the forests of Hawaii and Australia. The history of these developing countries include a period of colonialism in which Great Britain, France, Spain, and Portugal took land away from their subjects- native people - who had managed it for generations. Over time, colonial management of the land's resources tended to exploit those resources more than private owners would likely exploit their own land. Financially poor countries additionally hold large international debt—money owed to other countries. In order to repay debt with high interest rates, developing countries may be tempted to harvest their natural resources for income. Thus government policies on debt repayment, natural resource management and exports may contribute to degradation and loss of tropical forests.

Secondary causes of tropical deforestation relate to the activities that have immediate negative effects on forests. The major secondary causes are as follows:

Logging and logging roads, cattle ranching, cash crops, small-scale cultivation, and fuel wood, mining and oil drilling, large dams, tourism, new roadways

These causes can be grouped in various ways. For instance, logging roads create much the same problem as public highways by removing trees, causing erosion, and fragmenting habitat, while cattle ranching resembles mining because it requires large tracts of cleared forest.

The upheaval in the Amazon Basin provides an example of how human activities kill a forest over time. In the first phase, logging operations removes the best timber from a region, after which the timber company sell the land to cattle ranchers for their animals to graze. Ranchers leave a few trees standing for shade, but after the land has been overgrazed, the ranches move to other places and families buy the land at discounted prices. These families cultivate small gardens and perhaps cut down more trees for cash crops or fuel and hunt the native animals. Eventually, the small farms deplete the nutrients from the soil so that it supports little new plant growth. As the farmers move on to cleared land for cultivation, they remove more forest. Meanwhile, other parts of the forest disappear as mining operations and oil drilling companies burn the already damaged patches of forest because burning is easier and quicker than cutting and hauling out the logs. After a few decades of succession of these human activities, the forested land turns into a bleak landscape that cannot support substantial human, animal, or plant life.

PRESERVATION AND RESTORATION: While Preservation concerns with how to conserve and safeguard the tropic forest from degradation and depletion, Restoration involves activities that enable a degraded forest to recover

It's health and returns to normal growth hence the following steps.

First and foremost, a well planned process of reforestation should be introduced in degraded areas. Reforestation involves the planting of hundreds of seedlings containing a mixed population of native trees, to encourage the return of forest in the seeded areas to their original condition within some years, depending on the type of trees. The United States, Kenya and many other countries have used reforestation to restore land that had been cleared of its forests.

Secondly, Ranchers should reduce forest and soil degradation by employing the *slash and burn method.* Slash and burn is a process of cutting down large tracts of forest, letting the downed trees dry, then burn them in place to release nutrients into the soil. Soils in tropical forests tend to be nutrient-poor due to the dense vegetation they support. Slash-and-burn methods fortify the soil for grazing or agriculture, but eventually the added nutrients also diminish and the ranches and farms move to another part of the forest to begin the process again. This constant using up of land and moving on to healthier sites is called *shifting cultivation.* Abandoned land that has been treated this way can again support a healthy mixture of growth through ecological succession in the succeeding decades.

Thirdly, rehabilitation techniques which entail partially restoration of degraded forests should be employed by authorities and individuals alike.

Rehabilitation includes restoration of soil nutrients, selection of new plantings for fire or disease resistance, selection of species for erosion control.

Fourthly, for sustained preservation of tropical forest, there is need for sustainable harvesting, otherwise known as sustainable forestry. Sustainable harvesting/forestry relies on the concept that forests must be managed as a nonrenewable resource. Though tropical forests renew themselves over a span of years, the current rate of destruction/depletion—0.2 percent per year—will eliminate them faster than they can rebound. Sustainable harvesting methods therefore allow loggers to remove the timber they need while reducing damage to untouched trees. This method enables timber companies to use techniques that are gentler on the forest ecosystem, called *reduced impact logging* techniques. E.g.

Pre-harvest mapping and selecting trees of commercial value; cutting canopy vines before felling trees to prevent damage to the surrounding canopy; building narrow roads or trails through the forest to reach cuttings, rather than clear-cutting for major roads; employing directional tree felling to reduce damage to standing trees; reduction of wood waste by cutting stumps low to the ground; protecting watersheds with stream buffer zones; use of low-impact *yarding* systems—methods for hauling, timber from forests to trucks; incorporating restoration and rehabilitation methods in logging areas preventing illegal logging; developing tree plantations on severely degraded land to prevent erosion and desertification; performing post-harvest assessments to develop constant improvements; all came under reduced impact logging techniques.

Lastly, the fate of tropical forests rests on a combination of actions that originate at the local level and go to international programs. Industries and governments must commit themselves to conservation and preservation plans. Without government help, tropical forests will likely continue to shrink in size until they become an endangered ecosystem.

ONE SCHOLASTIC APPROACH: DOES PROGRESS REQUIRE THE CONQUEST OF NATURE?

Tiina Ojakallas
International Institute for the Sociology of Law, Spain

This paper will present an analysis of Marxist perspectives on economic ecology. Of course, there are many different approaches to the field. The aim here is not to diminish other standpoints, however, it is advocated that the work of Karl Marx have become increasingly applicable within contemporary society. Marxist perspectives focus explicitly on change, which characterises well economies and societies of the globalizing era. Furthermore, Marxism does not just help to raise threatening issues, it enables to offer possible solutions. This paper goes back to the early work of Marx, and argues that concepts such as irreparable rift and social

metabolism provide important tools for not only examining, but potentially, addressing environmental problems.

Today, we are facing a planetary environmental emergency regarding climate change, global freshwater use, loss of biodiversity, ocean acidification, ozone depletion, chemical pollution, etc. From this starting point it is argued that this catastrophe has its roots in the capitalist economic system. The expansion of the capitalist system is the cause of social exclusion, poverty, war and environmental degradation. This is happening through globalisation and imperialism, with the support of both repressive states and transnational structures.

It is becoming imperative that action is taken to curtail these problems. Questions must now be answered, such as: is it possible to create a new "nature/climate capitalism"; so the "bad" would be turned to "good", by using the same methods within the same technology framework?

In the Marxist view, capitalism is a passing historic system. Conflict, embedded in capitalist economy, will eventually and inevitably lead to social change. Human society is based on creative interaction between work and human-natural environment. What distinguishes people from animals is the skill to adopt with different natural environments by creating their own social environment. People plan their activities and organise themselves into groups which create culture, wherein they capture their experiences. A person actively shapes the world in which he lives, while at the same time, the world shapes them in return.

One of Marx`s ecological contributions lays in the theory of metabolic rift. Building on the work of Justus von Liebig, Marx argued that in shipping food and fibre hundreds and thousands of miles to the new urban centers of industrial production, where population was increasingly concentrated, capital ended up robbing the soil of its nutrients, such as nitrogen, phosphorus, and potassium, which instead of being returned to the earth created pollution in the cities. This was named "Raubbau" or the robbery system.

This robbery system took the form of "an irreparable rift" within capitalist society in the metabolism between humanity and the earth—"a metabolism prescribed by the natural laws of life itself"—requiring its "systematic restoration as a regulative law of social production." Marx suggested that in the industrialization of agriculture, the true nature of "capitalist production" was revealed, which can only develop by simultaneously undermining the original sources of all wealth—the soil and the worker.

The pressing environmental issues facing all populated areas constitute a practical reason to take ecological Marxism seriously. There is a price to pay for fast technological development and for overall products of globalization. The latest rapid and sustained growth has led to unparalleled environmental problems. Pollution is the introduction of contaminants into a natural environment that causes instability, disorder, harm and discomfort to the ecosystem. Ecological Marxism's emphasis on ecological crisis provides a way to solve environmental problems.

This paper will elaborate on the following idea: let`s propose creating an ecological civilization with an aim towards harmonious relationship between citizens and nature. The primary goal should be to form an energy- and resource-efficient and environment-friendly structure of industries, patterns of growth and modes of consumption. In principle, this is consistent with the ecological civilization and should be regarded as an important political reason to accept the concepts of ecological Marxism.

Ideas such as criticizing capitalism, caring for the poor, defending justice, and pursuing the common good, characterize Marxism. Besides preserving nature, today is claimed to protect ecological rights of individuals, families, communities, and nations, and defend ecological equality and ecological justice. Struggle for the previous supports Marx`s arguments. In addition, Marx`s ideology supports contemporary goals. Let me conclude with a thought, which Professor John Bellamy Foster uses to begin his millennium book: Progress does not require the conquest of nature.

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GREEN TOURISM IN AFRICA

Abraham Oladapo Okunlola
Sumy State University, Sumy, Ukraine

Today's international tourist is much more environmentally responsible, and is placing higher priority on green criteria when planning a holiday. South Africa is a long haul destination resulting in a large carbon footprint. Luckily South Africa offers many unique qualities which cannot be experienced elsewhere. These relate to its biodiversity, climate, landscape, coastlines, World Heritage sites, cultural diversity, political history and palaeo-biological significance. In addition to this,

South Africa has a seemingly infinite selection of outdoor activities which have always been of interest to tourists wanting to escape the European winter.

Ecotourism operations occasionally fail to live up to conservation ideals. It is sometimes overlooked that ecotourism is a highly consumer-centered activity, and that environmental conservation is a means to further economic growth.

Although ecotourism is intended for small groups, even a modest increase in population, however temporary, puts extra pressure on the local environment and necessitates the development of additional infrastructure and amenities. The construction of water treatment plants, sanitation facilities, and lodges come with the exploitation of non-renewable energy sources and the utilization of already limited local resources. The conversion of natural land to such tourist infrastructure is implicated in deforestation and habitat deterioration of butterflies in Mexico and squirrel monkeys in Costa Rica. In other cases, the environment suffers because local communities are unable to meet the infrastructure demands of ecotourism. The lack of adequate sanitation facilities in many East African parks results in the disposal of campsite sewage in rivers, contaminating the wildlife, livestock, and people who draw drinking water from it.

Aside from environmental degradation with tourist infrastructure, population pressures from ecotourism also leaves behind garbage and pollution associated with the Western lifestyle. Although ecotourists claim to be educationally sophisticated and environmentally concerned, they rarely understand the ecological consequences of their visits and how their day-to-day activities append physical impacts on the environment. As one scientist observes, they "rarely acknowledge how the meals they eat, the toilets they flush, the water they drink, and so on, are all part of broader regional economic and ecological systems they are helping to reconfigure with their very activities." Nor do ecotourists recognize the great consumption of non-renewable energy required to arrive at their destination, which is typically more remote than conventional tourism destinations. For instance, an exotic journey to a place 10,000 kilometers away consumes about 700 liters of fuel per person.

Ecotourism activities are, in of itself, issues in environmental impact because they disturb fauna and flora. Ecotourists believe that because they are only taking pictures and leaving footprints, they keep ecotourism sites pristine, but even harmless sounding activities such as a nature hike can be ecologically destructive. Have worn down the marked trails and created alternate routes, contributing to soil impaction, erosion, and plant damage. Where the ecotourism activity involves wildlife viewing, it can scare away animals, disrupt their feeding and nesting sites, or acclimate them to the presence of people. In Kenya, wildlife-observer disruption drives cheetahs off their reserves, increasing the risk of inbreeding and further endangering the species

Negative impact of tourism. Ecotourism has become one of the fastest-growing sectors of the tourism industry, growing annually by 10-15% worldwide. Many of the ecotourism projects are not meeting these standards. Even if some of

the guidelines are being executed, the local communities are still facing other negative impacts. South Africa is one of the countries that are reaping significant economic benefits from ecotourism, but negative effects - including forcing people to leave their homes, gross violations of fundamental rights, and environmental hazards - far outweigh the medium-term economic benefits. A tremendous amount of money is being spent and human resources continue to be used for ecotourism despite unsuccessful outcomes, and even more money is put into public relation campaigns to dilute the effects of criticism. Ecotourism channels resources away from other projects that could contribute more sustainable and realistic solutions to pressing social and environmental problems. But there is a tension in this relationship because eco-tourism often causes conflict and changes in land-use rights, fails to deliver promises of community-level benefits, damages environments, and has plenty of other social impacts. Indeed many argue repeatedly that eco-tourism is neither ecologically nor socially beneficial, yet it persists as a strategy for conservation and development. While several studies are being done on ways to improve the ecotourism structure, some argue that these examples provide rationale for stopping it altogether.

The industrialization, urbanization, and unsustainable agriculture practices of human society are considered to be having a serious effect on the environment. Ecotourism is now also considered to be playing a role in this depletion. While the term ecotourism may sound relatively benign, one of its most serious impacts is its consumption of virgin territories. These invasions often include deforestation, disruption of ecological life systems and various forms of pollution, all of which contribute to environmental degradation. The number of motor vehicles crossing the park increases as tour drivers search for rare species. The number of roads has disrupted the grass cover which has serious effects on plant and animal species. These areas also have a higher rate of disturbances and invasive species because of all the traffic moving off the beaten path into new undiscovered areas. Ecotourism also has an effect on species through the value placed on them. "Certain species have gone from being little known or valued by local people to being highly valued commodities.

Supervisor: Nataliya Vernydud

WASTE POLICY IN GERMANY

Iryna Oliinyk
Sumy State University,Sumy,Ukraine

The political credo of modern waste policy is: Avoidance, recycling, environmentally sound disposal! The German government advocates an efficient and economical supervision of waste. The act for simplification of supervision under laws pertaining to waste management, which entered into force on 1

February 2007, was an important step to ease the bureaucratic burden on waste management administration and industry and to strengthen the efficiency of supervision under waste management law. German commitment against export of e-waste. Every year, tonnes of valuable raw materials such as copper or platinum are lost to the German raw materials cycle due to export of waste. The German government champions a clear European regulation under which exporters must prove that the appliances to be exported still function and are not waste. Exporters will be charged for the costs of monitoring. The objective of the German government's policy on waste is to achieve a recycling-based economy that conserves resources and the environment. The owners or generators of waste are in the first instance responsible for waste avoidance, recovery, and disposal; in order to promote this environmentally sound recycling-based economy, balance sheets for different substances and materials must be drawn up. In addition, the Federal government has issued a waste incineration ordinance based on the Federal Immission Control Act.

The economic agents affected (producers and distributors) have come together to set up a "Dual Disposal System", which operates alongside the existing public waste disposal arrangements. The Duales System Deutschland GmbH (DSD) organizes the curbside collection of waste packaging directly from private households, the sorting of this waste into material groups, and the recycling of these materials. Since the introduction of the Green Dot System in 1993, more than 20 million tons of used packaging have been brought to recycling and the consumption of packaging per year has been reduced by about 1.3 million tons compared to 1991 levels.

On 28-th May 2005 the 3rd amendment of the packaging ordinance came into force. It simplifies the deposit on drink cans. In December 2004 did the European Court of Justice confirm that the compulsory deposit is in principle compatible with EU law. Consumers especially profit from the simplified deposit on one-way packaging - but it is also an advantage for fillers, distributors and small and medium-sized companies, since they are presented with a clear framework for their investments. The new provisions were implemented in two steps. The first step has already started immediately after its coming into force on 28th May 2005: There is only one standard deposit of 25 cent. In the second step as of May 2006, the compulsory deposit has been extended to all ecologically unfriendly one-way packaging and the so called individual solutions were discontinued. Under the "individual solutions", discounters only had to take back one-way drink packaging sold by their own sales chain. Since May 2006, stores that sell drink cans, glass or plastic bottles are obligated to take back corresponding packaging from other drinks manufacturers. Empty one-way bottles and cans can be returned to any outlet where one-way packaging is sold. This is also done to promote the development of a uniform nationwide return system which is now being build up by the economic operators. As of May 2006 the deposit is compulsory for all ecologically unfriendly one-way packaging from 0.1 litres to 3 litres. This includes

all packaging of beer, mineral water and carbonated soft drinks which had already been subject to deposit since January 2003. As of May 2006, a deposit must also be paid for non-carbonated soft drinks and alcoholic mixed drinks, especially the so called alcopops.

Waste Storage Ordinance into force since 1 June 2005. There is a new era of domestic waste management in Germany: since the 1 June 2005 wastes can no longer be landfilled in Germany without pretreatment. Domestic waste landfills became contaminated sites which result in costs for rehabilitation and after-care amounting to billions.

Since 1 June 2005 this has changed. Prior to storage, waste must be treated in such a way that it cannot degrade further or release pollutants. In future, recoverable substances will be separated in state-of-the-art installations and the energy from the wastes utilised. Only a small non-recoverable part of maximum 30% will still have to be stored in well-equipped landfills. Landfills with poor liners and a lack of technical monitoring will be gradually be closed down by 2009. For 12 years the industry, local authorities and environmental activists have been working towards 1 June 2005. Local authorities alone have invested €7.5 billion, especially over the past four years. 15,000 jobs have been created.

The Waste Storage Ordinance also implements the 1999 European Union Landfill Directive. Along with Austria, Denmark and the Netherlands, German waste management is thus assuming a pioneering role in the implementation of this EC directive.

Sustainable waste management that includes modern and efficient treatment technologies for waste helps to protect both resources and climate. The German government therefore advocates the further development of waste management at European and international level. Germany often takes on a pioneering role in shaping EU waste law. At national level the German government supports sustainable waste management concepts for obtaining raw materials or energy from wastes. German waste management has the highest waste recovery quotas worldwide, and thus already contributes significantly to sustainable management and climate protection.

The German government aims to achieve almost complete high-quality recovery, at least of municipal waste, by 2020. This will eliminate the need to landfill wastes, which has adverse effects on the climate. Resource and climate protection will be incorporated into waste management to a greater extent at European and international level over the next years, for example by minimising methane and CO2 emissions or substituting fossil fuels. Germany contributes know-how and innovative technology to reaching this target.

A REVIEW OF SUSTAINABLE CONSUMPTION IN NIGERIA

Olawale Oredugba
Sumy State University, Sumy, Ukraine

Nowadays many countries are facing the problem of unsustainable consumption which recently has pose danger to the environment.

Sustainable consumption is the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations.

The great challenge faced by economies today is to integrate environmental sustainability with economic growth and welfare by decoupling environmental degradation from economic growth and doing more with less. This is one of the key objectives of the Nigeria Government, but the consequences of climate change and the growing demand for energy and resources are challenging this objective. It is now time to move towards an energy and resource efficient economy.

Sustainable consumption and production maximize business potential to transform environmental challenges into economic opportunities and provide a better deal for consumers. The challenge is to improve the overall environmental performance of products throughout their life-cycle, to boost the demand for better products and production technologies and to help consumers in making informed choices.

Human demands on world resources have doubled over the last 40 years.Like most developed countries, the UK uses more than its fair share of natural resources like fuel, raw materials and water. The things people buy in the UK are often made elsewhere, so British lifestyles can damage the environment in other parts of the world.Increasing amounts of fossil fuels are burned to produce electricity and for transport – this produces carbon dioxide, which causes climate change.Food and other products put huge demands on water supplies at home and abroad.Wood can be a great renewable resource, but the world's ancient forests are shrinking because of the way people currently use it. The spread of urban development, illegal logging, agriculture and industry are causing trees to be lost. The size and rate of tree loss is about 36 football fields a minute.Over-fishing is a threat to ocean-life and to the food and livelihoods of over a billion people. As many as 90 per cent of all the oceans' large fish have been fished out. Responsible fisheries management is needed to help protect marine life and conserve habitats for future generations.

Impact of oil Industry on the Environment

The Niger Delta is one of the 10 most important wetland and coastal marine ecosystems in the world and is home to some 31 million people. The Niger Delta is also the location of massive oil deposits, which have been extracted for decades by

the government of Nigeria and by multinational oil companies. The majority of the people of the Niger Delta do not have adequate access to clean water or health-care. Their poverty, in contrast with the wealth generated by oil, has become one of the world's starkest and most disturbing examples of the "resource curse".

For the people of the Niger Delta, environmental quality and sustainability are fundamental to their overall wellbeing and development. According to UNDP, more than 60 per cent of the people in the region depend on the natural environment for their livelihood. For many, the environmental resource base, which they use for agriculture, fishing and the collection of forest products, is their principal or sole source of food. Pollution and environmental damage, therefore, pose significant risks to human rights.

Oil spills, waste dumping and gas flaring are endemic in the Niger Delta. This pollution, which has affected the area for decades, has damaged the soil, water and air quality. Hundreds of thousands of people are affected, particularly the poorest and those who rely on traditional livelihoods such as fishing and agriculture.

According to a study carried, the damage from oil operations is chronic and cumulative, and has acted synergistically with other sources of environmental stress to result in a severely impaired coastal ecosystem and compromised the livelihoods and health of the region's impoverished residents.The Niger Delta has suffered for decades from oil spills, which occur both on land and offshore. Oil spills on land destroy crops and damage the quality and productivity of soil that communities use for farming. Oil in water damages fisheries and contaminates water that people use for drinking and other domestic purposes.

There are a number of reasons why oil spills happen so frequently in the Niger Delta. Spills result from corrosion of oil pipes, poor maintenance of infrastructure, spills or leaks during processing at refineries, human error and as a consequence of deliberate vandalism or theft of oil.

Ways to tackle these problems:

- Organize a public education campaign designed to increase awareness of the environmental impacts of our consumption practices.
- Facilitate networks of sustainability practitioners to speed up learning and enhance collaboration.
- Oversee specific campaigns to encourage environmentally friendly consumption in specifically targeted areas: energy and transportation, food, and forest products.
- supporting the competitiveness of eco-industries.
- Most government policies in this area focusing on the environmental.

Impacts of unsustainable industrial production practices, primarily through regulations and taxes.

Supervisor: NataliyaVernydud

THE KYOTO PROTOCOL AND CLIMATE CHANGE - BACKGROUND INFORMATION

Denis Ovsyannikov
Saint Petersburg State University of Mineral resources (Mining), Russia

There is broad consensus in the scientific community that climate change is happening faster and to a greater extent than previously expected, confirmed by the Third Assessment Report from the Intergovernmental Panel on Climate Change (IPCC), which was the outcome of a process involving 2000 international scientific experts. Due to the projected growth of emissions of greenhouse gases, the world's climate could warm up by up to 5.8°C by the end of this century.

Under the UN Framework Convention on Climate Change, to which 186 countries are Parties including the EC and the US, industrialised countries are to stabilise their greenhouse gas emissions at 1990 levels by the year 2000. The European Union has met this commitment. The Kyoto Protocol to that Convention goes a step futher, by requiring industrialised countries to reduce their greenhouse gas emissions from 1990 levels by an average of 5% over the period 2008-2012.

The EU is committed under the Kyoto Protocol to reduce greenhouse gas emissions by 8% from 1990 levels by 2008-2012. According to European Commission figures, the total compliance costs of meeting the Kyoto Protocol targets can be as low as 0.06% of EU projected GDP in 2010, if the EU adopts the most efficient policies to reduce greenhouse gas emissions. The European Commission has already proposed measures including an EC-wide emissions trading system, a strategy to increase the use of alternative road fuels and improvements in the energy efficiency of buildings and will come forward with a range of additional measures in the next two years. These include measures on energy efficiency, promotion of combined heat and power, fluorinated gases and shifting the balance towards less polluting modes of transport. A Directive to promote electricity generation from renewables and agreements with car manufacturers on vehicle fuel efficiency are examples of measures that have already been adopted by the EU.

The EU's and Member States' greenhouse gas reduction targets are specified in the EC ratification decision, having originally been agreed in June 1998 under the so-called "Burden Sharing Agreement". These greenhouse gas reduction targets are:

Austria	-13%	Italy	-6½%
Belgium	-7½%	Luxembourg	-28%
Denmark	-21%	Netherlands	-6%
Finland	0%	Portugal	+27%
France	0%	Spain	+15%

Germany	-21%	Sweden	+4%
Greece	+25%	United Kingdom	-12½%
Ireland	+13%		
European Community	-8%		

Today's simultaneous deposit of ratification instruments by the European Union and Member States follows the agreement of the EC ratification decision and the completion of the internal ratification procedures in the fifteen Member States.

For the Kyoto Protocol to enter into force, it must be ratified by 55 nations and by the nations responsible for 55% of industrialised countries' emissions in 1990. The first threshold for the Kyoto Protocol's entry into force has now been attained. As of today, 70 countries have done so. The second threshold for its entry into force is now much closer, because the countries responsible for more than a quarter (26.6%) of industrialised countries' emissions in 1990 have now taken this step.

41 more nations have signed the Kyoto Protocol, including Russia, Japan, Canada, New Zealand and Australia. Every indication is that the Accession Countries, the EEA and EFTA countries, Russia, Japan and New Zealand will ratify, enabling the 55% of emissions threshold to be reached soon.

The United States is the biggest emitter of greenhouse gases with one of the highest levels of emissions per capita, and agreed to reduce its emissions from 1990 levels by 7% under the Kyoto Protocol. The EU has called upon the U.S. to live up to its responsibilities under the UNFCCC which requires industrialised countries to return their greenhouse gas emissions to 1990 levels. Furthermore, the EU and many other nations have repeatedly called for the US to return to the multilateral process for addressing climate change, and continue to do so.

INTERNATIONAL COOPERATION IN A STRUGGLING AGAINST FUNGAL DISEASE UG99 AS A PROMOTION OF SUSTAINABLE DEVELOPMENT

Artem Pastukhov
St.Petersburg State University of Refrigeration and Food Engineering

The threat of overpopulation of the planet and increasing scarcity of food are the most important problems of human ecology in the twenty-first century. All over the world, a lot of researches are conducted in order to find the ways to promote sustainable development of humanity. It is known that in order to provide that part of the population, energy supply of that lies between life and death (25-

30% of humanity), 200 million tons of wheat are sufficient , i.e., approximately 10% of world wheat production. But due to exposure to various pathogens and pests, approximately 250 million tons from the annual harvest are lost, i.e., that portion of the crop dies, which is enough for life support of the poorest groups of world population.

The last few years, scientists in Russia, Europe and the U.S. study the fungal disease Ug99. This is a variety of mold Puccinia graminis (Fig.1).

In scales of the world, 65 million hectares of agricultural lands are now threatened with an epidemic of this disease [1]. Identification of two new species of Ug99, TTKST and TTSSK, which were first discovered in 2006 and 2007 in Kenya, shows the rapid development of the fungus Ug99. Variety TTKST was the cause of a fierce epidemic in 2007 in several regions of Kenya and stroked about half of the wheat varieties, which were know before as resistant to Ug99 [2].

The threat of the spread of Ug99 in most of the countries can be minimized through the rapid identification of disease, manufacture and supply of new high-yielding and disease-resistant grain varieties.

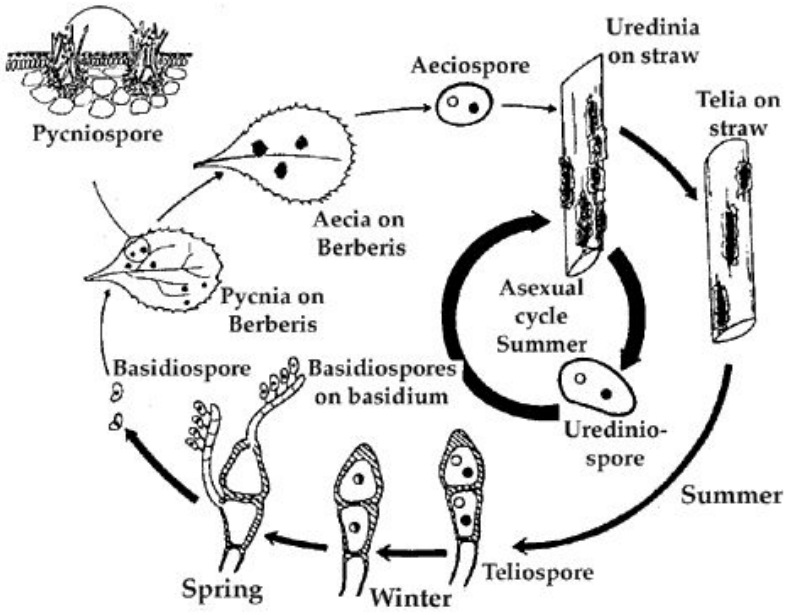

Figure 1. Life Cycle of Puccina graminis

Identification and dissemination of new, resistant to stem rust varieties is the best strategy on the way of their early use in the agricultural sector. This is an achievable goal, as most currently available wheat varieties were bred in

the 1990s. Potentially, a possible new harvest of spring wheat germplasm from that time is increased significantly. Testing of new lines of wheat resistant to Ug99 showed that the breeding of new wheat varieties with higher potential yield compared to existing varieties can become a reality. At present great attention is paid to increase the stock of seeds of such wheat varieties. Protection of the world wheat by long-term development of different varieties resistant to Ug99 can not be achieved without the continuation and expansion of the recently initiated joint researches. Traditional breeding, the molecular breeding and other activities that depend on the accurate selection, can not lead to success without international cooperation. Therefore it is necessary to continue work towards decreasing destabilization effects of stem rust disease on the world wheat production and food security. In the next five years it is necessary to create varieties that carry long-term resistance to rust. By 2020, the variety of new sources of long-term sustainability will be identified, and cultivated around the world. Methodology of struggle for the wheat crop is an example of how joint efforts of people from different countries can help to ensure the sustainable production of any agricultural products. Only international cooperation in the fight against pathogens of all crops will allow receiving the harvest, which would be sufficient to provide meal to people in developing countries.

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PREREQUISITES FOR ECOSYSTEM SERVICES ASSESSMENT IN UKRAINE

Olesya Petrovich
Megapolis ecological biodiversity research centre NAS Ukraine, Kyiv, Ukraine
Nataliia Gudkova
Inter-Regional Academy of Personnel Management, Kyiv, Ukraine

Ecosystem services defined as the benefits to humans that result from ecosystem functions and processes such as: major biogeochemical and nutrient cycles (e.g., of water, carbon, nitrogen, phosphorus etc.); natural pest control by

predators in food chains; pollination by insects, bats and birds; decomposition of biomass, wastes, and pollutions; soil formation, retention, erosion prevention, and maintenance of soil fertility; and climate regulation [4]. There were described 4 categories of ecosystem services: provisioning (food, fuel, genetic resources, etc.); regulating (water purification, disease control etc.); supporting (soil formation, nutrient cycling, etc.); and cultural (spiritual enrichment, recreation, and nonmaterial benefits, etc.). Ecosystem services assessment was determined as a powerful analytical tool for comparison of different alternative scenarios to choose the most optimal solution of nature management development [1].

In early 1980s the scientists of the Institute of Hydrobiology of NAAS of Ukraine (Kyiv) began their pioneering work on ecological economy and ecosystem services [6]. The value of ecosystem services provided by Ukraine's rivers and wetlands were estimated. They defined the monetary value of services provided by aquatic ecosystem, or their replacement cost if the natural services were destroyed by human activities, especially such as construction of dams.

Current case study of ecosystem services assessment was carried out in the framework of the WWF Danube-Carpathian Programme "Promoting Payments for Ecosystem Services and Related Sustainable Financing Schemes in the Danube Basin". Ukrainian scientists determined that a serious barrier to the introduction of payments for ecosystem services was fiscal and budgetary legislation of Ukraine. According to the willingness to pay analysis, consumers have low willingness to pay irrespective of economic conditions [6].

In Ukraine, the most popular and effective agroforestry practice is establishment and maintenance of shelterbelts, which generate a number of ecological goods and services to society, such as protection of watercourses, biological diversity, landscape embellishment, and carbon retention [2]. For example, they increase crop yields from 3 to 25% due to protection of crops against winds. However, these data correlate with such important factors as soil type, climate zone and weather conditions during the year, quantity of fertilizers, etc. [4]. A cost-benefit analysis of the windbreaks installed along the livestock barns was carried out in Canada [2]. This case study demonstrated that the windbreaks were highly profitable and offered important benefits for farmers. They provided such ecosystem services as protection of watercourses and problematic road segments, reduction of snow clearing cost, increase of crop yield, minimization of odours from livestock barns, etc. Results related to the monetary value of ecosystem services evaluated for over 40 year period demonstrated that their maximum total value was 30000-40000$ for a farm. It was found that the value of ecosystem services emanated from the agroforestry practices was significantly higher for the public than for farmers (excluding the aesthetic benefit, etc.).

Assessment of ecosystem services is important tool for biodiversity protection in Ukraine. In Russia, that studies were conducted to assess the values of endangered Siberian crane (*Grus leucogeranus*) and bison (*Bison bonasus*)

through the reconstruction cost method. The value was approximately 27000$ for one crane and 50300$ for a bison. Both case-studies were performed in the framework of reintroduction projects. This valuation is available for assessing wild fauna in hypothetical reconstruction projects [7].

Taking into account the prognoses of global biodiversity loss as well as decline of ecosystem services, it is extremely important to develop measures on support and management of ecosystems, and to implement the best management and political tools for their protection and sustainable use.

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THE INFLUENCE OF SOCIAL CAPITAL ON THE LEVEL OF SUSTAINABLE DEVELOPMENT ON THE EXAMPLE OF SUMY REGION

Yuriy Petrushenko
Sumy State University, Ukraine
Tetyana Holets
Center for Economic Research & Graduate Education - Economics Institute, Czech Republic

Social capital can be considered as an important background for providing social aspects of sustainable development. High level of social capital ensures the facilitation of initiatives of community members and authorities in prioritization and solution of local level problems, including ecological ones. Using regression analysis, we are planning to investigate an interaction between social capital and indicators of sustainable development of a community. Our initial hypothesis is that a high level of social capital might have positive effect on sustainable development of the community.

To study the effect of social capital, it is also important to understand better the sense of this concept and to see how one can achieve a high of social capital and sustainability as a potential consequence. As an important precondition of a high level of social capital, the community members should possess a high level of trust to each other, to the authorities, an ability to self-organize themselves, to cooperate with each other and with the governance. At the same time all these characteristics can stand for the consequences of high level of social capital. Thus, social capital is a complex concept. Therefore, it is important to determine the sense, structure and the methods of measurement of social capital.

Defining the concept of social capital we follow the way how Carpenter[2] (2002) defines the primitives of social capital: "… the primitives of the concept of social capital are those characteristics of individuals including trust, trustworthiness, reciprocity, generosity and the propensity to cooperate in social dilemmas that make economic activity possible when contracts are hard to enforce" (Carpenter, p. 119). This definition reflects the main characteristics which, as mentioned above, can stand both for the preconditions and consequences of high level of social capital.

We will use survey and experimental methods to measure the level of social capital in Sumy region. According to Carpenter (2002) these methods are complements to each other, they offset the drawbacks of each other and thus their combination can give the most reliable results in the analysis of social capital. We have already started a survey process in Sumy region using the worked out survey methodology.

[2] Carpenter, J. P. *Measuring social capital: Adding field experimental methods to the analytical toolbox*, forthcoming in Sunder Ramaswany, Johnatan Isham, and Thomas Kelly, eds, Social Capital, Economic Development and the Environment (Edward Elgar), 119-135.

As a survey method we are using the questionnaire designed based on the Integrated Questionnaire for the Measurement of Social Capital worked out by the World Bank, The World Values Survey, The European Social Survey, and The Social Capital Question Bank, which is based on the Office for National Statistics survey matrix. We designed the questionnaire taking the specificity of Ukrainian communities into account.

We are planning to use factor analysis to isolate subsuming components of social capital. Initially, eight components are considered in our questionnaire: traditions of the community; information and communication; empowerment and political action; trust; solidarity and inclusion; general norms; collective action and cooperation; and general characteristics of the community which also include information on groups and networks and the quality of life in the community.

Specification of these components will allow us to understand the structure of social capital. One can distinguish determinants, dimensions and results of social capital. A relative agreement regarding the dimensions of social capital exists in scientific circles. However, discussions still exist regarding determinants and results of this concept.

The survey method will also allow us to double check the results of planned economic experiment. Third, the public good game, which we are going to use as an experimental method, will not allow us to measure such important social aspect as the ability to interact with the authorities. The game captures just the interaction between the community members. However the survey contains the set of questions related to interaction with the governance. The questionnaire also includes the questions, which ask respondents to define the changes of certain issues over time. It is important since we will be able to see whether the social capital changes over time and to analyze the trend of changes for different communities.

Along with the survey, we are planning to use the experimental method. The experimental method will allow us to reflect real life situation and to overcome the subjectivity of the survey method. Carpenter (2002) has identified four types of the experiments which can be used to measure the level of social capital: the trust game which can be used to measure the level of trust and trustworthiness; the ultimatum game which measures reciprocity; the dictator game which measures altruism; and the public good game which measures the ability to cooperate. We are going to use one of these types of the games.

To conclude we should say that the research will allow us to understand sense, structure and the methods of measurement of such complex concept as social capital. The key part of the research will be to measure the effect of the main components of social capital on the indicators of sustainable development in Sumy region. Hence we will be able to test our initial hypothesis that a high level of social capital might have positive effect on sustainable development of the community.

INTRODUCTION OF PROGRAMS FOR RESOURCE CONSERVATION IN DNIPROPETROVSK REGION

Maria Pimenova
Dnipropetrovsk State Financial Academy, Ukraine

The problem of resource depletion and environmental pollution on national and global scales has acquired a systemic character. On the one hand, the scarcity of all types of resources constrains production growth, services growth and technical upgrading (in case of a favourable situation for selling domestic products on world markets), on the other hand, the lack of funds for technical and technological modernization leads to over-consumption of material and energy resources and to unsustainable use of these resources. Thus, a no less important problem of economizing of material and energy resources arises.

Despite the extreme urgency and efficiency of energy conservation measures, their implementation at Ukrainian enterprises today is hindered by a number of problems such as unavailability of funding sources for resource conservation projects, imperfection of national legislation, shortcomings of national planning in resource conservation, inefficient use of economic instruments to stimulate resource conservation, underground economy, deficit of pertinent information and lack of skilled personnel in this sphere. Besides, it is necessary to consider such negatives caused by competition in a market economy as free prices aimed at receiving super profits through the creation of artificial deficit via decrease in supply, and substitution of domestic resources with foreign supplies which are often accompanied by lobbyism and corruption. Therefore, the efficiency of the national economy becomes dependent on the dictates of foreign countries.

However, the main issues to be addressed include the development of an effective mechanism for resource conservation, the ways to stimulate investments in alternative technologies, improvements in energy efficiency, introduction of energy saving projects, and provision of reliable financial support for these measures.

Everyone has the right to a safe living environment, which has to be implemented through environmental policy instruments on national and regional scales.

The main instruments of national environmental policy encompass a range of tools: a) cross-sector partnership and involvement of stakeholders;

b) evaluating the impact of strategies, programs and plans on the state of the environment;

c) improving the permit system in the field of environmental protection;

d) environmental impact assessment;

e) environmental audit, environmental management system, and environmental labelling;

f) environmental insurance;

g) technical regulations, standards and accounting in the field of environment, natural resources and environmental safety.

Regional environmental policy is implemented at two levels: as a national level strategy and as regional policies. The latter are aimed at creating conditions for improving resource use efficiency in the region, ensuring people's well-being, refining the structure of material production, improving environmental quality, developing social infrastructure, promoting entrepreneurship, and stimulating economic and social growth of the region. The provisions of regional policy are founded on the principles of balanced development, which are formed in their turn on the systemic basis and include all aspects of sustainable regional development.

The following regional programmes operate in Dnepropetrovsk region:

– the regional integrated waste management plan;

– the programme for environmental protection in Dnepropetrovsk region for 2005 - 2015;

– the programme of creation and development of the national ecological network in Dnepropetrovsk region for 2006 – 2015;

– the environmental monitoring plan in Dnepropetrovsk region;

– the programme of improving the ecological condition of Dnepropetrovsk region by reducing emissions of pollutants from major enterprises for 2007–2015;

– the regional targeted programme of using disturbed soil in the area of mining enterprises as elements of the ecological network in Krivoy Rog Iron Ore Basin and Nikopol Manganese Ore Basin for 2010 - 2014.

The implementation of these programmes will help:

- to create an effective system of environmental education of Ukrainian population;
- to improve the environment so that it is safe for the life of people - with the European standards of environmental quality being taken into account;
- to permanently reduce and gradually eliminate the relationship between economic growth and environmental deterioration;
- to stop the loss of biological and landscape diversity and to form a coherent and representative ecological network;
- to create a system of sustainable use of natural resources;
- to minimize soil pollution by dangerous pesticides, herbicides, heavy metals and harmful wastes;
- to make the transition to integrated environmental management in the sphere of environmental protection and ensure development of the environmental component in sectors of the economy;
- to reform the tax system by reinforcing the importance of environmental taxation which is viewed as a stimulant to reduce a negative impact of business on the environment;

- to develop an effective economic mechanism of environmental management;
- to improve the state system of environmental monitoring and the system of information support to managers during the decision-making process.

METHODS AND MEANS FOR AUTOMATED ANALYSIS OF STATE BUDGET EXPENDITURES FOR SUSTAINABLE DEVELOPMENT

Nataliya Pinchuk
NTUU "KPI", Kiev, Ukraine

Current realities of the world need an adequate understanding of the future, monitoring the current situation, monitor the set of environmental factors, assess potential threats and risks. The difficult socio-political and economic situation in the world, increasing competition in various sectors of society require the heads of various organizations to improve the quality of management decisions. Can't make the right decision without having diverse information about explicit and implicit processes in controlled structure and the environment.

Model Verification and analysis of the state budget is based on multidimensional data represented. The basic concept of multidimensional data model is the concept hypercube of data is a set of cells $3(P^{i},M_{i})$, that meet a set of measurements and set the values $P^{i}=\{p_1,p_2,...,p_z\}$ of measurements

$$M = M_{p_1} \cup M_{p_2} \cup ... \cup M_{p_z} \qquad (1)$$

where $M_{p_z}=\{m_{1_z}, m_{2_z},..., m_{kz}\}$ - set of labels expressed p_z (for example, the set of labels measuring M_{p_z} the financial and economic indicators that define the regions in areas of the country, with the values of measurements monthly, quarterly, annually

$$M_{p_z}=\{m_{1_z}, m_{2_z},..., m_{kz}\} \qquad (2)$$

Based on multidimensional data representation model for monitoring and analysis of the budget process consists of a set of financial and economic indicators $\{P_z^{fep}(D,V)\}$, where D - the set of indicators of income, V - set spending parameters set of macroeconomic indicators - P_z^{mep} and the balanced solutions - F^{scd} based on specialized software analysis - $\Pr_m^{\circ}$ that is, specialized (or adapted to the requirements of the domain) information technology.

$$P_z^{fep} = \{P_{pl}^{fep}(D,V) \cap P_r^{fep}(D,V) \cap P_{op}^{fep}(D,V) \cap P_{fo}^{fep}(D,V) \cap P_{ac}^{fep}(D,V)\}$$

(3)

where - $\{P_{pl}^{fep}(D,V)\}$ budget targets contained in the relevant annexes to the law "On State Budget" (planned value of income - D and expenditure-V);

$\{P_r^{fep}(D,V)\}$ - Painting the budget - a detailed plan that defines the actual order of performance (monthly, quarterly or annual) in different sections;

$\{P_{op}^{fep}(D,V)\}$ - Set of indicators that are formed on the basis of financial reporting of budget funds Φ_η^{fin};

$\{P_{fo}^{fep}(D,V)\}$ - Data on the financial performance under accounting fiscal authorities - Φ_η^{fo};

$\{P_{ac}^{fep}(D,V)\}$ - Data on cash performance-based treasury reporting - Φ_η^{ac}

The idea of monitoring and analyzing performance is compared to the universal indicators (indicators) that define the industry and come from various sources, with those calculated directly in the system. The main tasks are:

• monitoring the current state of the set P_z^{fep}, including regional and branch cuts - a group of functions F_{mf}^{scb};

• control of banking and credit institutions, including regional breakdown - a group of functions F_{bnk}^{scb};

• organization of checks - a group of functions F_{ac}^{scb};

• Generation of report forms - a group of functions F_{rp}^{scb} that take into account the specific subject area.

Examples of use scenarios in the development process depends on the methodology development. In some methodologies for the development of all that is required is a brief overview of the scenario. In other scenarios are complicated and vary during development. In some methodologies, they may start as a brief business scenario, develop a detailed system use cases, and then grow into a very detailed and exhaustive tests.

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ECOLOGIZATION OF MARKETING IN FOREST SECTOR

Vira Polovska
National Forestry University of Ukraine, Lviv, Ukraine

Gradual ecologization of economic activity leads to transition from market to ecological economics in all sectors of national economy. Ukrainian forest sector provides utilization, renewal, protection, and conservation of forest resources to meet the needs of national economy and people in accordance with the concept of sustainable development.

Forest sector of the economy has many problems. One of them is low level of innovations, which restrains adoption of modern marketing systems in forest and wood-processing enterprises. Environmental awareness is low, which leads to poor results in economic activities, social and environmental problems in local communities. Analysis of foreign experience reveals that marketing theory should apply in forest sector.

Theoretical developments of marketing application in forest sector started in Western European countries in 1970's. The research focused on the issues of forest products sales and communication policy. In 1980-1990's marketing application was extended to forest services and environmental protection policy. Marketing on wood-processing enterprises was developing in its traditional form, whereas marketing on forest enterprises was intended to be integrated into all levels of operational management. It was oriented on full satisfaction of consumer needs.

Social, environmental and economic crises, globalization, technical progress pushed the ecologization of marketing. Foreign experience indicates that orientation on consumers, society and environment plays the key role in operational activities of forest enterprises. Marketing should be integrated into management and economic activity of Ukrainian forest and wood-working enterprises, as shown in Figure 1.

Figure 1. Integration of environmental marketing in forest sector.

Today only some aspects of environmental marketing are integrated into forest sector. Although integration of conventional marketing into forest sector is taking place, theory of its implementation was not developed yet and only some empirical research was done. Further theoretical research is needed in the field of marketing theory adoption in Ukrainian forest sector, especially in the context of global tendencies of transforming market economy into economy of sustainable development.

Currently the main problem on forest products market is low demand in Ukraine and abroad. Lumber is one of the most environmentally friendly raw materials for building industry. Industrial countries show trends of rising demand on products, made from renewable natural resources with small environment footprint, and high level of environmental awareness among consumers. These tendencies should be accounted, since they open a prospective for future growth. To find solutions for environmental, economic and social crises the focus should be on higher levels of wood processing on domestic market, segmentation of forest products market, innovations and strategies development for this products positioning.

Environmental marketing is seen as logical extension of classical traditional marketing. Decision on adoption and implementation of environmental marketing on the enterprise should be made after thorough analysis of its business capacities, macro-environment, and possible positive and negative effects. Successful adoption of environmental marketing may lead to surplus in returns in the long-run as a result of production's ecologization and development of competitive environmental products.

Ecologization of marketing on Ukrainian forest and wood-processing enterprises should be done by further developing the concept of environmental marketing. To succeed, businesses in forest sector should implement theory of environmental marketing into practice; adopt modern information systems, advance innovations and improve environmental awareness.

THE NOTION ABOUT ENERGY PRODUCT AND ITS LIFE CYCLE

Svitlana Priymenko
Sumy State University, Sumy, Ukraine

Product and goods - the economic category notion. Product is an item or set of items that are manufactured in the company. It is a result of the production process. After the manufacturing process a product is got into the market and acquires the goods properties. In the economic domain the term "goods" means the product of nature, human labor or human labor only in the material and immaterial substance and in the service form, which due to its properties can

satisfy present or assumed social needs, which are designed for the exchange, buying and selling or the product of labor, which is manufactured not only for self-consumption but for sale.

According to the referred material above, these economic categories have different life cycles.

Product life cycle (PLC) is the period of time of new ideas' origin, its practical realization in the new products to the obsolescence of these products and their removal from production, a significant decrease of their practical use.

Lifespan of goods (LG) – period, when the goods is viable, is rotated in the market, is used, brings profit revenue to the producers and sellers.

The term "energy products" means the products that in any way possess certain energy. Energy product is considered to be the eventual outcome of a certain activity, but not its content. Then the energy product life cycle is the period from the origin of the new ideas for getting of the final energy product, making efforts to extract or obtain the energy resources and their further reorganization into electrical energy to its complete consumption and possible ways of utilization.

The main stages of the energy product life cycle are the following: the origin of the idea according to the energy product, its realization in the research works; extraction of energy resources (coal, gas, peat, uranium ...), energy resources processing in a condition which is suitable for the energy product production; power generation; appearing of different waste of the economic activities; the utilization of the present product waste at the various stages of the life cycle; the distribution of electrical energy; the consumption of the electrical energy; the utilization of electrical energy.

Taking into the account an ecodistructive environmental load of the products of different energy product life cycle stages, one can say there is a relationship of cause and effect between them. The impact of the previous stage is the result of the significant economic losses of the next one. To reduce the bad influence of each stage of the energy product life cycle for the environment, one should make an energy ecologization at the level of certain stages and at the level of the whole industry as well.

ECONOMIC INCENTIVES IN THE SYSTEM OF ENVIRONMENTAL-ECONOMIC RELATIONS

Abaas Saady M.
Sumy State University, Sumy, Ukraine

Environmental protection in Iraq suffers from a lack of means allocated by the government. In these conditions improving of economic mechanism of the environmental protection plays a crucial role. The main objective of the economic

mechanism is to rich the goals of state environmental policy by economic measures.

The purpose of the research is to define the content, place, and role of economic incentives in the total system of environmental protection measures taking into account the existing level of knowledge about economic methods of natural resources management.

Economic incentives - an objective necessity, and at the same time, an integral form of the industry functioning. Effectiveness of the real sector of economy largely depends on a system of economic incentives. Applied to the field of environmental protection economic incentives means the existence the system of economic levers and instruments in the economic mechanism of environmental protection aimed at ensuring a single economic policy in the environmental protection. Creation of well-functioning mechanism of economic incentives in environmental management is a complex problem. Mechanism of economic stimulus is justified in terms of improving the efficiency of social production in general, and in terms of need to solve practical environmental conflicts that take place due to lack of coordination of economic interests in the environmental field, a sharp increase of the tempo and intensity of the industry impact on the environment, impaired reproduction of environmental elements.

The mechanism of economic incentives in the system of ecological and economic relations objectively reflects specific forms of economic contradictions in this sphere and, as such, is aimed at resolving these contradictions. The degree of effectiveness of this mechanism depends on the character and strength of manifestation of contradictions. Perfection of mechanism of economic incentives depends on the direction and depth of study of environmental contradictions.

Economic incentives mechanism in environmental protection aimed at implementing the following environmental and economic interests:

- creation economic mechanism which allows to combine rational development of production and efficient reproduction of the environment optimally;
- improving the socio-economic efficiency of environmental activities at the national and industry levels and levels of industrial enterprise (economic entity);
- stimulating of a common technical policy in environmental protection;
- creating economic interest of companies in the timely construction, entry into service and modernization of environmental facilities;
- increasing interest of the company in the effective use environmental protection technology;
- increasing material incentives of the employees in environmental protection.

There are two groups of methods of ecological-economic incentives: the methods of positive motivation and methods of negative motivation (Table 1).

Table 1 - Methods of ecological-economic incentives

Instruments of economic incentives	
Positive incentive measures	**Negative incentive measures**
Preferential taxation of environmental kinds of products	Payments for natural resources
Preferential crediting and subsidization of ecological projects	Payments for emissions (discharges) of pollutants
Subsidies for the purchase of environmental equipment	Payments for waste disposal
Accelerated amortization of environmental equipment	Fines for violation of environmental legislation
Bonuses based on the results of environmental activities	Reducing subsidies of non-environmental industries
	Increased taxation of non-environmental products

Ability to ensure effective functioning of incentive mechanism in environmental protection is increasingly determined by the perfection of the planning system. However, the incentive mechanism has certain autonomy and has impact on the system of environmental protection planning, presenting to it corresponding requirements.

Thus, the economic incentives in the system of environmental-economic relations, is part of a common economic mechanism of social production, aimed at implementation of environmental and economic interests in the preservation and reproduction of the environment.

Analysis of the existing system of environmental payments in Iraq allows us to conclude following:

1) stimulating function of payment is not implemented due to the low level of basic rates;
2) payments don't inhibits depletion of natural resources.

BIOLOGICAL METHOD FOR WATER QUALITY CONTROL

Daria Safronova
Saint-Petersburg State University, Saint-Petersburg, Russia

Problem

Saint-Petersburg is located at the Neva river and almost all drinking water for 5 million inhabitants is taken from it. Talking about water supply centralised source for Saint-Petersburg, one can mark a lot of negative factors influencing the water quality. Surely, agricultural pollution, transport and economical problems are among them.

Being a navigable river, Neva can not be secured against all risks connected with the boat traffic and ship accidents and following water contamination. It is necessary to add that in Saint-Petersburg the rain water is flushed into the Neva river without any purification, consequently all pollution from the land transport drains into the water which is later taken for drinking needs. Besides, water pollution affects inhabitants of the Neva river. Neva has a unique ecosytem formed with brakish water species from the Gulf of Finland and fresh water species from the Ladoga Lake. Among them there are some migratory fish species which also have a great commercial value.

Water is not for free. Water consumers pay for the drinking water purification and it works so far as concerns everyman, but some problem appear in respect to the industrial enterprises. According to the principle "polluter pays", many of them have to pay big taxes for their activities, but in fact they do not.

Biological water quality control

Modern hydrochemical sensor based systems for superficial waters do not allow the simultaneous observation of numerous chemical substances which harmful influence can be unexpectedly dangerous. Besides, these systems can not be used for objective and quick definition of danger degree in change of water composition for native hydrobionts. For that reason we do need to use the biomonitoring methods to define the true level of water toxicity. Now the methods and technical systems based on the the registration of aborigine benthal invertebrates' biomarkers are being developed for continuous ecological monitoring. The special place is given to identification and study of physiological biomarkers which can be used for conceptual development of automated real time control systems of ecosystem health and status.

The most promising among various methods for water enviroment chemical safety monitoring are those which give an ability to control the water quality by means of functional state (physiological biomarkers) of animal put into the water using the non-invasive registration. This last condition has a special value for water bodies used for the purposes of aquaculture or as a source of centralised water supply. This is exactly the method and adequate bioelectonic system developed several years ago in the laboratory of experimental ecology of aquatic systems (Saint-Petersburg Scientific Research Center for Ecological Safety, Russian Academy of Sciences). This automated system is used for the means of real time water quality control and is based on the non-invasive registration of decapods' or molluscs' cardiac activity, referred to as one of the most essential indicators of the animal's functional status. The analysis of heart rate variability is conducted using the modified variational pulsometry method. This approach allows to investigate influences of chemical substances, in particular toxic ones, on variational pulsometry characteristics, because hitting these substances into waterbodies or in water supply network can harm ecosystem and/or population health.

CONFLICTS BETWWEN ECONOMIC GROWTH AND ENVERONMENT

Mohamed Saleh
Kharkov National University of Radio Electronics,
Kharkov, Ukraine

Protection of the environment has become exceedingly important, and promises to be more important for the benefit of the world and for future generations. The process involves rules of international cooperation, sanction, or both, so that some government actions to enhance environmental protection will not be undermined by the actions of other governments or its own action. Will the world be able to sustain economic growth indefinitely without running into resource constraints or despoiling the environment beyond repair? Are there trades-offs between the goals of achieving high and sustainable rates of economic growth and attaining high standards of environmental quality?

Economic growth refers to a rise in national or per capita income and product. If a production of goods and services in a country rises, along with its average income increases, the country has achieved economic growth. Economic growth can be either positive or negative. Negative growth can be referred to by saying that the economy is shrinking, and is associated with economic recession and depression. Economic growth defined the increase in the value of goods and services produced by every sector of the economy like industrial sectors which are major source of environmental destruction. It is usually expressed in terms of the gross domestic product or GDP of the country. While environment is the sum total of all surroundings of a living organism and non living organism, including natural forces and other living things, which provide conditions for development and growth as well as of dander and damage.

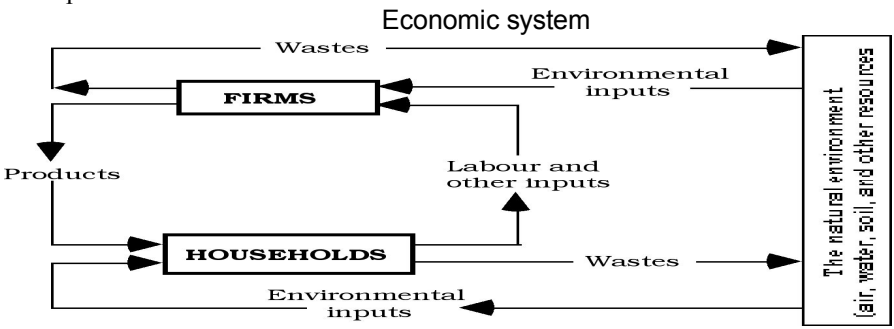
Unfortunately, we live in the real world and in the real world, there are often trade-offs to be made between economic growth and environmental protection and it is very wrong to eliminate the concept that there is no conflicts between this two activities, environmental conflicts are not constrained to a region, town or country. In contrast they are global problem of first importance when government remains apathetic to meet its people demand.

The conflicts of economic growth versus environmental conservation can also be seen as developed countries vs developing ones. Industrial countries such as the USA and Germany have depended upon polluting industries for their wealth. Now they fear that uncontrolled economic development in the Third World will lead to environmental disaster. They point out that massive clearing of tropical rainforest for farming threatens biodiversity and may affect the global climate. At the same time relying upon heavy industry adds more pollution to the air, soil and water sources, while a richer population demands more energy, often produced from burning dirty fossil fuels such as coal. Developing countries such as China,

Iran and Brazil point out that they must make industrialization and economic development a priority because they have to support their growing populations. Developing countries cannot afford to worry about the distant future and limit their own growth to solve these problems.

Clearly, the natural environment is an important component of the economic system to attained economic growth, and without the natural environment the economic system would not be able to function. Sustainability of economic growth requires materials drawn directly and indirectly from the environment which are, ultimately, returned to the environment as waste products. As such, the economy (i.e., production and distribution, or industrial activities, and consumption, or final demand activities) cannot ignore its linkages to the environment. As shown the diagram below

In conclusion economic growth and protecting environment is a pair of contradiction because of environment worsens with a high speed economy increasing. The choice of the industrial structure is a factor affecting the environmental pollution. Generally speaking by agricultural and light and heavy industry pollution level, technology also is an important indicator to affect the environment. The country using low technology consumes more resources and more pollution.



Ecologically and economic growth sustainable development must maintain ecosystem resilience the continued ability of ecosystems to provide future generations with services in spite of natural and human-driven disturbances. Many current ecosystem management strategies are unsustainable, focusing on a single service such as the production of food, fuel, or fiber to the neglect of others. Such strategies can reduce biodiversity and ecosystem resilience by eliminating native species, introducing new and harmful species, converting and simplifying habitat, and polluting the surrounding environment.

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FINANCIAL ASPECTS OF HOUSE BUILDING ECOLOGIZATION IN UKRAINE

Tatiana Salnikova
Dnipropetrovsk State Financial Academy, Dnipropetrovsk, Ukraine

Presently, the environmental problem is vital for each country. In Ukraine it is aggravated by such things as misuse of natural resources, disobeying the law and high density of stationary polluters in a limited area. A significant part of pollution - chemical, physical and biological contamination – is caused by industries, including the house construction business. The purpose of the article is to clarify housing affect the environment, identify financial sources of its improving.

Therefore, strict government regulation and finding ways to increase interest of manufactures and builders in greening their operations are equally important. In 2011, a number of environmental programmes were adopted: these were programmes of soil fertility maintenance, land reclamation, water resources management, waste management, environmental monitoring, formation and development of ecological networks, and others.

Among numerous adverse impacts of house building on the environment, the most important ones include wastes from construction and production of building materials, wastes created during the wrecking of a building (demolition debris), excessive energy consumption, and the negative health effects of harmful substances contained in building materials.

When a house is being put into operation, the sanitary inspection has to accept it at any rate, and the Research Institute of Hygiene can check the house only if it receives a claim. Since the range of building materials in construction is wide, we can only hope that they do not contain harmful substances, or that the company is concerned about its reputation.

The range of building materials in construction can be divided into relatively safe ones and those that require tight control. According to engineers of the Research Institute of Hygiene, over 50% of all building materials in the domestic market can't be called safe for health. For example, formaldehyde and phenol regarded as the most unfavourable components in dirty premises are present in almost all polymeric materials, flake board, carpeting, and glues. One of the most

widely used chlorinated plastic polymers is polyvinyl chloride (PVC) commonly referred to as vinyl. Meanwhile the US Green Building Council has acknowledged that the chlorine content of PVC building materials and the resultant dioxin emissions "puts PVC consistently among the worst materials for human health impacts." Radon can also be dangerous to health and life. Cement is quite a friendly building material but only if it does not contain additives.

There is no doubt that using 'green' and high quality building materials could become one of the solutions to environmental problems. All materials should have hygienic conclusions from sanitary and epidemiological expertise and be certified. Nevertheless, in 2011 such an effective tool for preventing damage to the environment and human health as ecological inspection was liquidated.

Transition to the policy of sustainable development involves not only meeting housing needs but also building resource-saving houses, whereas current multi-storey buildings are characterized by low energy efficiency. However, with the threat of energy crisis looming and within the national environment protection and energy conservation policies, Ukrainian business will have to pay more attention to environmental and economic innovations in house building. According to the adopted energy strategy, which implies taking energy conservation measures, energy intensity calculated as units of energy per unit of GDP, is expected to decrease twice in Ukraine by 2030 - to 0.41 kg of standard fuel per USD.

It should be noted that production of building materials has ample energy saving opportunities. Presently, the construction sector consumes about 30% of all fuel used in Ukraine, 85% of standard fuel being consumed in functioning houses. Transition to dry cement production is going to reduce energy consumption by 0.5 million tons of standard fuel per year. For instance, 30-40% hollow in bricks can reduce gas consumption by 100 million m^3 per year (25% of the total volume). The programme "Energy efficiency in construction" is aimed at improving thermal properties of houses and transition of the building industry to using energy-efficient constructions of external walls.

The experience of other countries shows that financing is an essential component of sustainable development. Numerous strategies for mobilizing capital toward sustainability projects can be used to provide the ways and means for local and national governments to finance the development and maintenance of sustainable systems. These may be governmental grant programs and preferential taxation policies, giving concessional loans for energy-saving businesses and granting tax exemption for environmental protection funds, implementing green pricing programs for utility companies investing in renewable energy technologies and many other financial tools.

Such environmental instruments don't function in Ukraine. The mechanisms through which subsidies influence the formation of environmental infrastructure and the national market of environmental services are not developed.

It goes without saying that implementation of the National Environmental

Strategy must be based on the systemic expansion of the financial base of the environment protection, this base being balanced with the GDP and budget revenues. It is necessary to extend the environmental tax base and use economic instruments of stimulating ecological behaviour in manufacturing and construction.

Overall, truly sustainable house building should incorporate economic and environmental issues to provide a house that is affordable and environmentally sound. The key instruments should involve environmental compliance, i.e. conforming to environmental laws, regulations and standards, environmental monitoring, appropriate funding of environmental measures and using high quality construction and finishing materials.

THE ROLE OF RECYCLING IN A GREEN ECONOMY

Polina Savchenko
National University «Kyiv-Mohyla Academy», Kiev, Ukraine

A green economy balances economic goals with a focus on social equity and maintaining environmental systems. The United Nations Environment Programme (UNEP) has recently helped structure and inform discussions by elaborating a working definition of the green economy. According to UNEP (2011a): «A green economy is one that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. The development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and as a source of public benefits, especially for poor people whose livelihoods and security depend on nature». [1]

Key elements of the green economy:

- internalising externalities;
- improving material and energy efficiency and ultimately decoupling material and energy use from economic growth;
- shifting from a linear economy to a circular economy;
- shifting from non-renewable to renewable resources. [1]

Recycling contributes in several ways to each of these four principles.

The recycling sector is growing and developing but it is currently dominated by seven core groups of materials: glass, paper and cardboard, plastic, iron and steel, copper, aluminium and nickel, precious metals, other metals. The turnover of seven core groups of recyclables almost doubled from 2004 to 2008. [1]

Transforming the “waste sector” into a “materials management sector” will create more jobs, reduce greenhouse gas emissions that cause climate change, and lower other types of pollution and related public health

consequences. [2] Recycling creates more jobs at higher income levels than landfilling or incinerating waste. Dumping 10,000 tons of waste in a landfill creates six jobs while recycling 10,000 tons of waste creates 36 jobs. [3]

Other than creating new businesses and jobs, recycling benefits the economy and generates revenue through material sales as well. In most cases recycling has lower environmental impacts compared to producing virgin materials. As such, recycling is ranked third in the waste hierarchy: it is less desirable than preventing and reusing waste but preferable to energy recovery and disposal. [1]

There is definitely a market for recyclable materials and the returns on investments in the recycling industry can be quite high. Communities can make money by selling some of their recyclable materials. There are countries that do not have their own natural resources and forests, but import waste material, such as paper, as raw material for their manufacturing industries. For example, countries like China, South Korea and Japan import recycled paper or waste paper, and are able to depend upon the low-cost, economically viable options of recycling to cope with the storage of natural resources in some regions. And as the market for recyclable materials increases, the revenue generated within the industry increases as well. [3]

It is cheaper to make products using recycled materials. For example, using fresh aluminum costs twice as much as using recycled aluminum. This is because a lot more energy (ie. 90% more) is needed to extract aluminum from its raw forms. Subsequently, products that are made from recycled materials can also be purchased at a cheaper price.[3]

As more items are reduced, the amount of waste that needs to go to the landfill or incinerator is also reduced. Through recycling, communities can save on their waste disposal costs, which can be very expensive. In addition, through the sale of the recycled materials, communities can also offset the cost of their waste disposal, thereby further reducing their expenditure. [3]

Recycling ensures that resources remain in the economy via a closed-loop process. It contributes to a shift to a circular economy and away from a linear economy model characterised by resource depletion and waste. [1] Nevertheless, recycling can't meet all the resource demands partly because the growing economy accumulates goods, for example in construction sector. This accumulation acts as long-term storage for materials that will not be available for recycling for many years. In addition, there are technical limits for recycling, which vary depending on the material, and the quality of recycled materials often does not fully match demand. As a result, some materials are considered to be 'downcycled' rather than recycled. [1]

This way numerous opportunities exist for eco-innovation and development of new technologies in the recycling sector, potentially creating markets for new products and services. [1]

Moreover, as a promising eco-industry sub-sector recycling is increasingly

important for the economy, contributing to total economic output (GDP). [1]

Recycling benefits the environment by diverting waste away from landfill, thereby avoiding pollutant emissions. It also helps meet the material demands of economic production, preventing the environmental impacts associated with extracting and refining virgin materials. [1]

Economical mechanisms are the unreplacable tools for making changes in the modern system of production and waste disposal. The basic economical approaches are based on the natural patterns of existance of the natural resources. It is well-known that what is ecologically that is economically. Recycling is beneficial from the ecological dimension of sustainable development pattern as well as economical. And without the mechanisms of one of these two driving forces of Sustainable development the situation would not change. Social dimension and the social mechanisms are of the same importance and the changes in economical and ecological parts will influence it as well.

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SYSTEM OF UKRAINE WIND ENERGY POTENTIAL MANAGEMENT

S. Shevtsov, A. Shavanov
Sumy State University, Sumy, Ukraine

Effective resource management is one of the conditions which are needed for perspective economic and social development. The solving of the problem concerning the providing of sustainable production needs resources, especially fuel and energy, it will be possible with the introduction of long-term strategy for rebuilding the economy, which is aimed at the increasing the alternative energy sources using.

One of the most perspecting areas of the alternative energy sources is wind energy.

The problem of wind energetics is an interesting area of research for Ukrainian and foreign scientists, among which are the works of B. Mokin, V. Polishchuk, P. Armless, D. de Renzo, G. Geletukha, M. La Page, M. Disendorfa etc.

Wind energy on Earth is estimated at 175-219 thousand tV/h per year. This is 2,7 times more than the total world energy consumption. However it is possible to use effectively only 5%, but nowadays this number is less.

Creating a rational system of Ukrainian wind potential management needs attention, because a great amount of wind energy is distributed unevenly on the territory of the country. In the southern regions wind potential is much higher than in the north regions. Ukraine has a large shallow water areas (more than 60 thousand sq. km.) with high wind potential (average wind speed higher than 6 m/sec), and according to the experts it is the best base in Eastern Europe for the wind energy development.

Due to the future investments total power of Ukrainian wind energy stations is increasing to 16,000 mW in 2020, with a possible annual energy production of about 32 billion kW/h, representing 11% of total volume of energy production in Ukraine. Nowadays the cost of kW/h of energy that is produced by wind energy stations is 7 cents in Ukraine and the projected cost will be 4 cents per kW/h till 2025. For comparison, in Ukraine, the energy for the population costs 0.2436 grn. per kW/h. In 2011 the total power of installed wind power station in Ukraine was 87.5 mW. Currently, about 1170 wind turbines with power to 10 kW each are installed in Ukraine.

Scientific researches and engineering that are focused on using wind energy investigate two directions: using wind energy in regional energy systems and in local (autonomous) energy systems. Currently, using wind energy in local energy systems is widespread in countries with high living standards, while using of wind power into Ukrainian regional power systems is reasonable, for example, in solving energy problems of individual farms.

However, due to the governmental support in this area, the active introduction of modern technologies in wind energy can make this industrial direction quite significant. Industrial base of Ukraine allows to realize the task of building wind energy stations and production wind equipment for the needs of our country and for export to other countries. Products of domestic manufacturers more reliable in rugged weather conditions in Ukraine and has a price advantage against imported products. Ukrainian equipment is successfully exported and used in many countries.

Ukraine hosts some measures to support wind energy. For example, the adoption of a new Tax Code has established certain features in the taxation of alternative energy in Ukraine. By 2020 companies that produce renewable energy are exempted from income tax, VAT transactions of imported equipment that work on renewable energy are also exempted from customs duties. Value of land for placement of renewable energy objects costs only 25% of the total bid.

However, for mass introduction of wind energy and its efficient using it is necessary to do such steps:

- provide a consistent nationwide growth wind turbines producing;

- to provide support and participation in the development of wind energy on the local level;
- active introduction of modern technologies in wind energy;
- elimination of subsidies for environmentally harmful energy can lead to some increasing in energy prices, easy to run, it will ensure the development and more intensive using of alternative energy;
- increasing in self-conscious business entitiesand population, using energy;
- development of market infrastructure, stabilizing prices, giving an access to a common electric network for all owners of wind power;
- implementation of the measures to curb a monopolism in producing and trading electric energy;
- taking into account of the cost of electric energy its ecological component;
- supporting of the researches, development and spreading new engineering and technology in the field of wind energy;
- creating information centers which provide an objective and independent information about wind energy stations that are situated on the market;
- creating necessary conditions for small consumers with the aim to stimulate them to transit on the using of renewable energy.

Thus, the wind energy is really a promising field of energy sector and the development of this sector leads to the effective implementation of the resource saving policy. The development of wind energy in Ukraine requires efficient management of this sector, the introduction and implementation of strategic models. In modern times of economic instability it is not easy to do, but in the long term importance of wind energy will increase, the price of energy produced such way will decline and that is why the development of this energy sector is efficient for economics and society.

APPROACHES TO SUSTAINABLE DEVELOPMENT ATTAINMENT

Yulia Shkodkina
Sumy State University, Ukraine

In the second part of 20th century, international community agreed upon the concept of sustainable development as a leading development model. Many researches were undertaken and articles were written so far. Nevertheless, there is no unity in the definition of the very term “sustainable development”, nor in the ways of reaching the latter.

The concept of sustainable development is interpreted accordingly to one’s interests, overwhelmingly favouring one dimension over others, which leads to many different mechanisms and tools for moving towards sustainability invented.

All viewpoints on sustainable development attainment can be referred to one of two different approaches, namely reforming and transformational. Though one

may consider more approaches to achieving sustainable development, we categorise only two groups with the aim of understanding conceptual difference between them.

First of all, every approach implies certain degree of sustainability – from weak to strong sustainability. Weak sustainability supposes that different kinds of capital are perfect substitutes, in other words, it is possible to replace natural capital with human-made one. Whereas strong sustainability requires maintaining each type of capital above its critical levels.

Furthermore, approaches differ by its nature, which is primarily ecocentric or anthropocentric, although both strives for human well-being. Thus, considering the degree of sustainability and the nature of approaches following matrix of approaches was built (Figure 1).

Reform approach suppose changes for sustainable development within current socio-economic system, which requires some reformation. While transformation approach implies that problems are rooted in fundamental features of present society. Therefore, the latter assumes changes in socio-economic system through political action and governance. The former sees changes through new technologies and economic tools, which is secured by business.

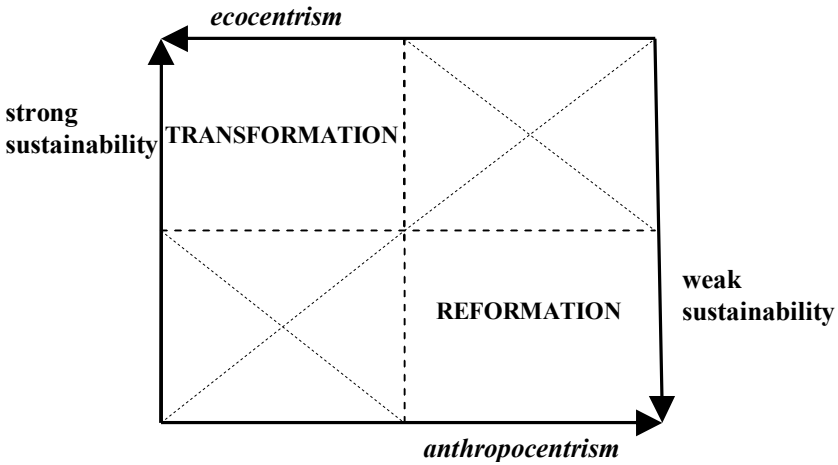


Figure 1. Matrix of conceptual approaches to sustainable development attainment

Reformists consider economic growth as the way of overcoming problems to do with reaching sustainable development. Consumer power concerned with sustainability issues increases GDP for all humanity. On the other hand, transformists suppose increased consumption needs of the poor, but achieved through redistribution rather than more growth. Consumption should be based on sufficiency criteria.

As well as that, approaches differ in its model of sustainability and therefore in the importance of one aspect of sustainability (economic, environmental, social, institutional) over another.

All considered differences are summarized in the Figure 2.

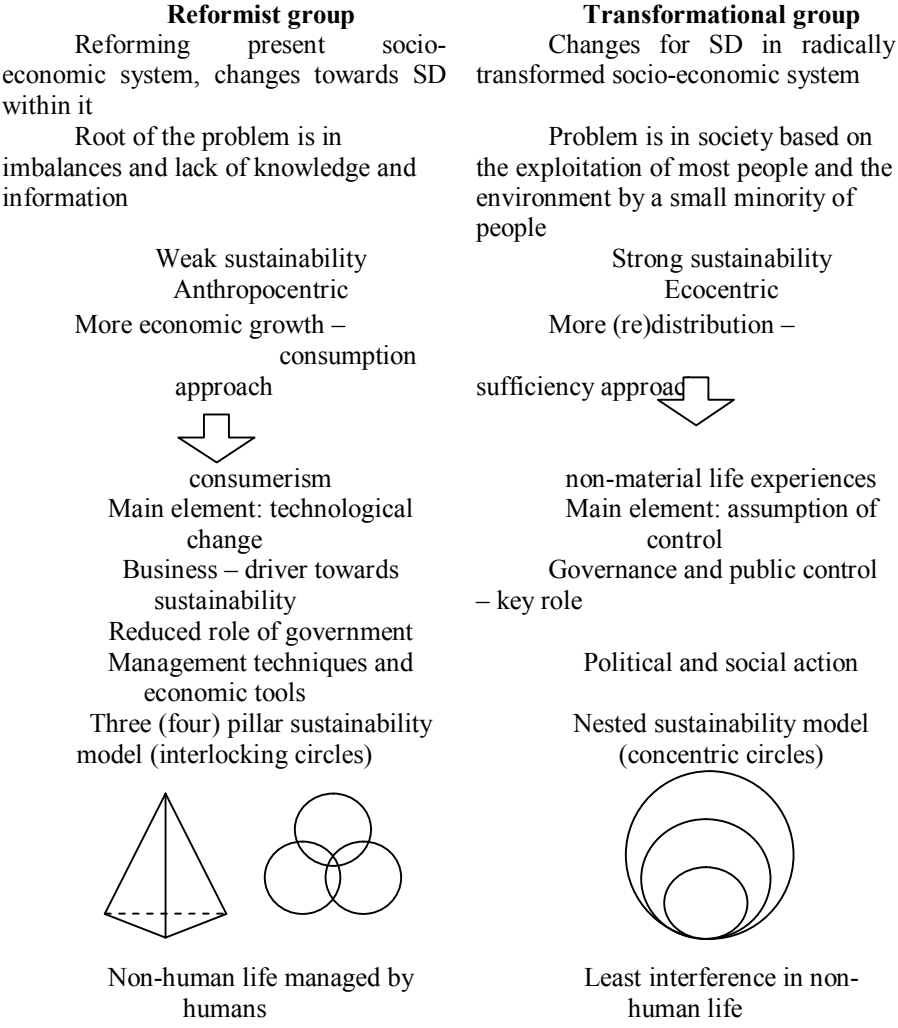


Figure 2. Characteristics of conceptual approaches to sustainable development attainment

RENEWABLE SOURCES USED TO PRODUCE ELECTRICITY IN EUROPE. CONFERGENCE OR DIVERGENCE?

Aleksandra Sikora
University of Lodz, Graduate Lodz, Poland

There are some ways to achieve sustainability. One of objective, described in European regional policy, is known as a convergence between European regions and countries. Moreover, there is a strong pressure, to develop sustainability by increasing renewable sources in electricity production. This abstract examines the results of policy, mentioned above. First of all it will show tendency in the rate of renewable sources in electricity production, during last 20 years in European Union. Moreover it will examine its balance between regions.

There are some approaches to define convergence. Usually, this process is known as a situation, when less developed regions go through positive changes faster than better developed regions. In relation to renewable sources in electricity production, convergence takes place, while rate of these sources increase faster in countries with low values at the firs period of analysis. It means that in future, disparities are decreasing, therefore, development will be sustainable. If disparities grow, there is a divergence.

This abstract will examine linear trend of rate of renewable energy in all energy production within European Union. This kind of model is described by equation as below and it is estimated by OLS method:

$$y_t = at + \varepsilon ,$$

where y is a rate of renewable sources, used to produce electricity in each year, t time variable, a is a parameter. While $a>0$, there is an increase of analysed value y in time.

Models of convergence are a bit more complicated. The most popular analysis is β convergence analysis, based on Barro Model. Usually this model is estimated using methods of panel data analysis, such as GMM (dynamic panel model) or static models (FEM, REM, OLS). Although panel models gives better quantities of data, are better adjusted, we need just easy OLS model, to see the tendency.

$$\ln\left(\frac{Y_t}{Y_{t-1}}\right) = \beta \ln(Y_{t-1}) + \varepsilon ,$$

where $\left(\frac{Y_t}{Y_{t-1}}\right)$ is a rate of growth of rate of renewable sources used to produce electricity, and Y is a rate of its sources in year t

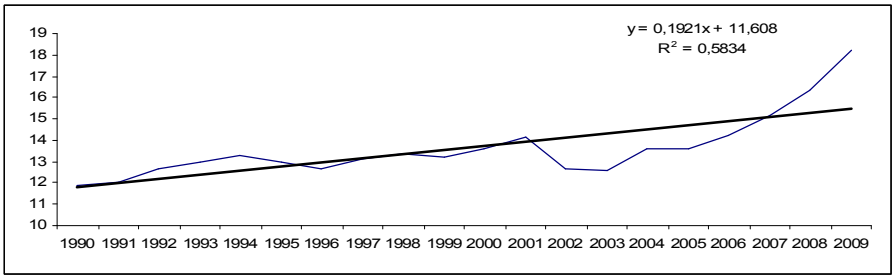
If $\beta<0$, convergence exists.

If β convergence exists, it is good to examine σ convergence, which occurs, when disparities between countries falls in time. The most popular measure of disparities is indicator V, based on standard deviation:

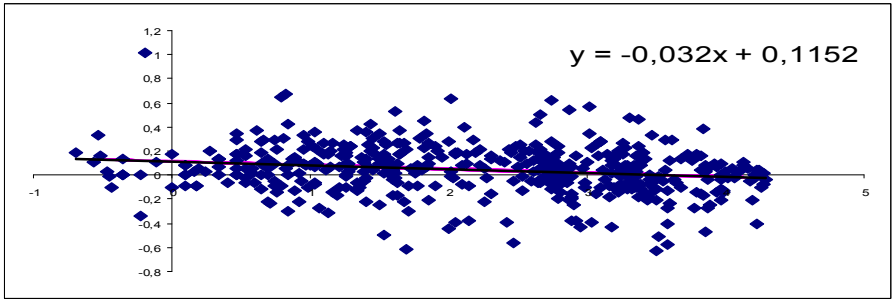
$$V = \frac{D}{X},$$

where D is a standard deviation and X is an average for all countries in each year.

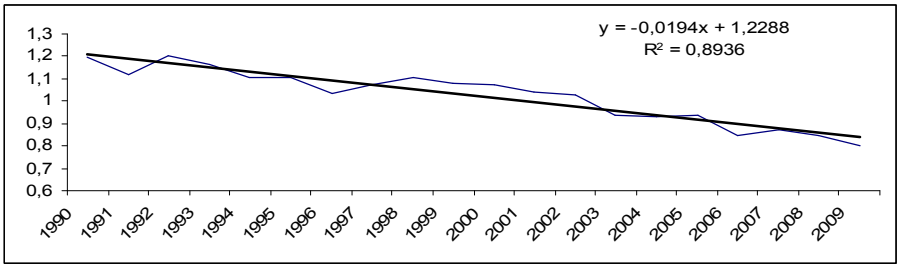
1. Linear trend of rate of electricity produced from renewable sources.



2. Model of β convergence. OLS estimation using panel data.



3. Examination of σ convergence.



Following analysis, which has been done, there is a positive trend in rate of renewable sources in electricity production In European. Every year this rate increases by 19%. Following analysis of β-convergence, parameter β = -0,03. Therefore, there is negative relation between rate of renewable sources and the speed of its grow. It means that there is a β convergence between countries. Moreover, analysis of σ-convergence confirms its existing. Disparities, measured by standard deviation indicator, decrease in time. Every year they are 2% lower.

Positive results of this analysis, are confirmation, that European policy, which aims to achieve sustainable development by increasing rate of renewable sources and keeping balance between countries, is successful.

ECOSYSTEM SERVICES EVALUATION: PROTECTED AREAS AND CULTURAL HERITAGE SITES

Kira Sitkina
Lomonosov Moscow State University, Moscow, Russia

Protected areasand cultural heritage sites provide essential benefits, most of which are externalities and have no market prices. This result in underestimating such territories, so protected areas and cultural heritage sites are traditionally considered as less competitive compared to other alternatives. Besides, underestimation of ecosystem services causes ineffective management, social conflicts and declines efficiency of environmental policy and heritage protection programs.

Protected areas and cultural heritage sites can occupy essential part of a country and perform several functions (such as biodiversity conservation, education, science research, population recreation and heritage protection), including provision with ecosystem services nearby areas. Researches in protected areas' ecosystem services evaluation show that such services haveasignificant economic value and in some cases are essential for local communities' welfare as for Russian as for world protected areas.The same is true of cultural heritage sites and especially of territories that combine both natural and cultural importance. In addition such areas are legal entities, so there are huge opportunities for them to be suppliers on ecosystem services' markets.

To solve the problems and get on ecosystem services markets protected and cultural areas have to identify and evaluate full range of ecosystem services.

The methodic of protected areas and cultural heritage sites assessment includes ecosystem services evaluation.Ecosystem services evaluation technique is based on theMillennium Ecosystem Assessment' classifications and concept of Total Economic Value.It should be mentioned that the services provided by ecosystems depend on the type of ecosystem, geographic location and extent of human intervention.The author selects main components of protected area or cultural heritage site (architecture complex, forests, wetlands, other ecosystems) for each of which services are listed.After that all elementsshould get economic values. Approaches to the assessment of these components may vary depending on the information available and the conditions of the assessment. Evaluation techniques include market prices, hedonistic pricing, replacement costs, changes in productivity and other techniques.Finally total value may be discounted according to the aims of assessment.

Suggested methodic was applied to evaluate ecosystem services of National Park ”Lake Pleshcheevo” (Russia, Yaroslavl province). The park is functioning since 1988. Nearby Pereslavl-Zalessky, an ancient town with historical and cultural importance, is located on the Pleshcheevo’s bank and wasa part of protected area till 1998. National park covers 23 772 ha of which 5 080 ha are Pleshcheevolake and 15 271 ha are forest area.

Ecosystem services were identified for following major ecosystems: the lake, forests and marshes. The lake provides such services as fishery, water supply and tourism (direct use value). Indirect use value of lake includes recreation, flood prevention and habitat for wildlife. Direct use value of forests contains timber after forest maintenance logging, wild berries, forest mushrooms and tourism and indirect use value of forests is presented by carbon sequestration. Ecosystem services of marches include wild berries, forest mushrooms, tourism,flood prevention and habitat for wildlife and cleaning services.

The services of direct use value are estimated by local market prices and tariffs. Techniques for evaluation of indirect use value’ components are varying. Carbon sequestration is valued by carbon market prices. To evaluate water cleaning functions substitute goods technique is used. Other evaluations are made by extrapolation of data obtained from research by K. Schuyt and L. Brander.

Figure 1.shows the structure of ecosystem services’ economic value.

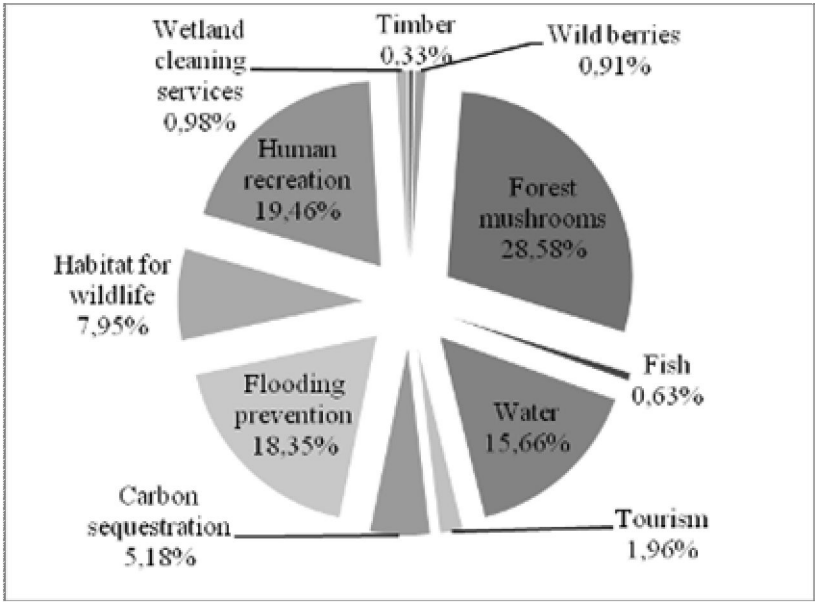


Figure 1. Economic value of “Lake Pleshcheevo” ecosystem services, %

The value of ecosystem services provided by the National Park varies between9562.3 and 12019.3 thousands euro, 4972.1 thou of which are regulating services.

Combined with cultural and historic values of Pereslavl-Zalessky National Park "Lake Pleshcheevo" provides significant benefits as for local as regional and countrywidecommunities.

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A CRITERION OF THE COORDINATION OF THE INTERESTS OF DIFFERENT GENERATIONS

Iryna Skliar
Sumy State University, Sumy, Ukraine
Mykola Kostel
Shostka Institute of the Sumy State University, Shostka, Ukraine

The sustainable development principles realization stipulates the change of character of nature using and requires the improvement of theoretical and methodological bases of research of mutual relations of society and environment in accordance with principles of sustainable development. Coordination of interests of different generations is one of basic principles, which is to be the basis of the decision of the indicated problem.

Conducted research of the motion of the structure of national wealth in the process of socio-economic development allows to substantiate the ecological debt as the base of estimation of parameters of coordination of ecological and economic interests of different generations and ground the factors of increase and factors of decrease of ecological debt.

We suggest to use conception of ecological debt for the estimation of long-term co-ordination of ecological and economic development. Ecological debt is being estimated on the basis of national wealth.

The structure of national wealth consists of three constituents - natural, human and produced (physical, fixed) capital.

Thus, the factors of increase and factors of decrease of ecological debt we suggest to examine as factors of decrease or increase of produced, natural and human capital.

The detachment of the noted factors can be examined as a problem of cost estimation of constituents of national wealth, which is one of most issues of the of

modern economic science. Some scientists mark impossibility of realization of national wealth theory elements because of lack of statistics.

The factors of decrease of ecological debt are suggested :

1. Net investments increase the volume of physical capital potentially
2. Expenses on education.
3. Expenses on science.

Such list of decrease factors is conditioned with availability of data for their quantitative determination and scientifically accepted for the estimation of national wealth.

A substantiation of list of factors of increase of ecological debt is more complex task because of their economic evaluation possibility.

Among the factors of increase of ecological debt we suggest to detach:

1. A volume of the used natural resources (their economic evaluation) including the changes of their quality.
2. Economic damage from ecological violations, which is consequence of economic activity.

A volume of the used natural resources including the changes of their quality is the main factor of increase. Researches show that decrease of national wealth is mainly due to one of his constituents - natural capital.

The question of account of factor of time can be examined as a problem of comparison in time (discounting) of economic values which characterize ecological and economic interactions in the evaluation of nature resources.

It is possible to consider discounting of the so-called external effects the effective mechanism of concordance of ecological and economic interests .

The World bank recommend to apply social rate (The Social Rate of Return on Investment - SRRI) in the calculations of national wealth as norm which is the basis of allocation of resources between generations. This rate is offered for the developed countries in the interval of 2% - 4%.

As the basic criterion of coordination of the interests of different generations, which reflects the estimations of the quality of socio-economic development is proposed a Rate of Efficiency of Intertime Allocation of Resources (REIAR)

We suggest to use the social rate of discounting in determination of rate of efficiency of intertime allocation of resources (REIAR)

Also, we propose to conduct the calculation of the estimation of corresponding factors on two different moments of time - beginning and end of period of coordination: the factors of diminishing of ecological debt on the end of period of coordination, and factors of its increase - on beginning

The rate of efficiency of intertime allocation of resources is determined as such rate of discounting, which counterbalances the grown cumulative size of factors of increase and discounted cumulative size of decrease factors.

Economic sense of this index (its positive value) can be interpreted as some conditional rate of profitableness. Considering the economic value of national wealth on the certain moment of time (beginning of period of concordance of ecological and

economic interests), as a capital which is invested in further development, then the REIAR can be interpreted as a rate of return , which is formed as a result of the extended reproduction.

Statistically this index characterizes the average annual rate of increase (decrease) of ecological debt, equal to decrease (increase) of national wealth on the prognosis period of coordination.

Obviously, that the negative value of this index demonstrates the inconsistency of interests of present and future generations, because the accretion of ecological debt or decrease of prognosis value of national wealth take place for period of evaluation under conditions of current technology, pollution and waste levels.

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WASTE MANAGEMENT: EUROPEAN EXPERIENCE FOR UKRAINE

Denys Smolennikov, Yuliya Nadtochiy
Sumy State University, Sumy, Ukraine

Some years ago Ukrainian government made separate efforts to implement the household waste sorting in our country but they were unsuccessful. The last try took place in October 2011 when Ministry Of Regional Development Construction And Housing Of Ukraine introduced Resolution approving the Methodology separate collection of household waste.

According to the Resolution, separate collection of household waste is collection of household waste by individual components, including the sorting of household waste for further processing and recycling.

This Resolution has already come into force but Ukraine is still overflowing with garbage. It happens because of the problems in waste management. Many countries of Europe have huge experience in waste collecting, sorting and recycling that can be successfully used in Ukraine.

Developed countries such as Germany, Austria and Sweden made waste recycling a priority and now they deposit onto or into land less than 1% of all garbage generated.

Here is more information about waste management in 2011 in some European countries according to Eurostat statistics (Table 1).

There is no such data available about Ukraine but most sources report that almost 80-90% of waste in the country is deposited into land. Other garbage is incinerated and only 3-5% of all waste is sorted and recycled.

Table 1 – Waste statistic information (selected Europe countries)

GEO/WASTE (1000 tones)	Generated	Deposit onto or into land	Incine-rated	Material recycling	Other recycling including composting
Czech Republic	3 334	2 162	497	452	76
Germany	47 691	186	18 020	21 251	8 234
France	34 535	10 745	11 730	6 143	5 917
Hungary	4 129	2 838	406	737	148
Austria	4 960	35	1 465	1 495	1 965
Poland	12 038	7 369	102	1 783	790
Sweden	4 364	42	2 124	1 560	587
United Kingdom	32 450	15 870	3 750	8 050	4 550

Today there are approximately 30 plants on the territory of Ukraine that utilize waste. But that's not enough because of the old technology they use. Incinerating of non-sorted garbage is also not a way to solve the problem. That's why 10 modern plants are planned to be built in different cities of Ukraine. Construction must start from 4 recycling plants near Kyiv in 2013. But waste must be sorted to be recycled or burned. It can be done in different ways (Fig. 1).

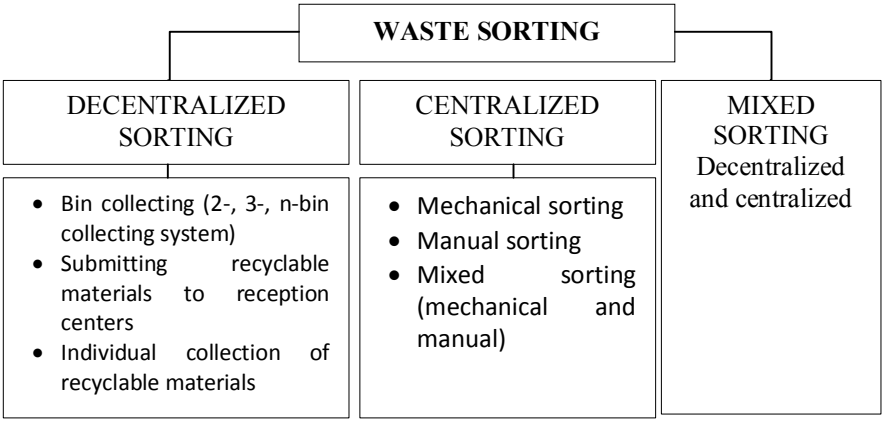

Figure 1. Different ways of waste sorting

The easiest way to reduce the cost of waste sorting is to sort it at home and put it separately into specialized bins. Germany is one of Europe's leaders in sorting. People there don't only separate paper and glass from plastic and food. They also sort bottles and jars by color, separate paper tissues from magazines and

newspapers and rinse cans before throwing them away. It's much work to do but the aim is to prevent as much garbage as possible. People understand that most garbage is then resorted at the plant manually that's why they take home sorting very seriously.

Another way to reduce waste is reuse. Many people in Europe use baskets for markets and cotton bags for supermarkets every time they go shopping instead of using the plastic carry bags provided by the store. Returnable product options and refill packs are also very popular. For example, egg cartons can be reused and beverage bottles can be refilled at the shop.

There is also a program in Germany called the Green Dot. If you buy a product with a Green Dot on it, which means the manufacturer is assisting in financing the recycling of the packaging, you help to solve the waste problem.

In Austria the focus is also on prevention of waste. State and local programs are aimed at measuring packages and hazardous substances' limitation in waste used as fuel and promotion of recycling.

Speaking about Ukraine it's hard to guess how much time it will take to teach people to sort waste and reuse things. The country desperately needs a whole system including regulation, education and special funds in this field. The government needs to do more than just offering free categorized garbage bins and posters. A lot of work must be done including visiting people, giving them enough information and shoving them how to behave with the garbage.

ENERGY SUPPLY OF COUNTRYSIDE BASED ON GEOTHERMAL DEPOSIT

V.O. Splavska, O.O. Dudukova, V.V. Dubrovska, V.I. Shklyar
National Technical University of Ukraine
«Kiev Polytechnic Institute», Kiev

The economy of any country is based on the usage of natural conditions and resources that were formed on its territory. The change of climate due to the greenhouse gas emission makes significant losses into economic and business activities of the country [1].

Ukraine has signed and ratified the Kyoto Protocol, allowing an us to be involved in the mechanism of international pollution quotas trading by the «green investments» scheme, in accordance with it received funds must be invest into the real projects pointed at reducing greenhouse gas emission or at adjacent areas. According to the international market quotas for Ukraine accounted for more than 13%, and received funds have been invested in projects of several regions of Ukraine (Crimea, Luhansk, Sumy, Ivano-Frankivsk regions) in 2011 [1].

Economic growth will lead to the increasing the greenhouse gas emission, which gradually exhaust quotas limit, therefore total modernization and increasing

of the efficiency, including energy industry, and market quotas in this context are more assistant than restraint.

It's necessary to define the «weakest» places and the most energy-deficit regions, where the problem of energy supply needs immediate actions, for the efficiency's increasing of the energy sector of Ukraine. The solution of this issue is possible by the way of implementation the alternative energy sources at the expense of «green» investments.

The goal of work: to analyze various schemes of the energy supply of Medvedivka village (Crimea) based on the geothermal deposit.

The results of work:

- analyzed the current state of energy supply of Medvedivka village;
- calculated electrical and thermal load of the village;
- defined the basic problems and perspective ways of the solving the issue of energy supply;
- carried out the comparative analysis of different schemes of power supply: the centralized power supply from energy system and the decentralized power supply from power plant based on gas engine or gas turbine using fire gas obtained from the thermal medium, or natural gas;
- examined the following district heating schemes: from boiler on the traditional (natural gas, coal) or renewable (domestic waste, agricultural waste) fuels; using the heat of thermal water from the well and equipment cooling system or the waste-gas heat;
- defined the efficiency, environmental impacts (level of the greenhouse gas emission, noise, vibration, etc.), economy and integration capabilities of different schemes in a unified energy system.

During the analysis were used RETScreen software, HOMER Energy software and materials of the FS of mini geothermal power plant in Medvedivka NAS of Ukraine IRE [2].

Conclusions:

- according to the project thermal load (Q_{tw} = 709 kW) of the village is covered by the heat of thermal water (t_{tw} = +74 ° C), and to cover the peak heat load use gas water heater (Q_{peak} = 52 kW); for electric supply use remade for gas fuel internal combustion engine (Ne = 60 kW);
- according to the calculation nowadays thermal load (heating, hot water supply, ventilation) is 1,155 MW; electric load (domestic consumers, auxiliaries of mini geothermal power plant) is 60 kW;
- found the discrepancy of thermal power of the mini geothermal heat and power plant for the necessary graph of heat load and inefficient usage of the combustible gas in the remade engine, what lead to the overexpenditure of fuel and environmental pollution;
- according to the analysis of different schemes for power supply, in terms of impact on the environment the best performances has gas turbine (total greenhouse gas emissions by 15% oxygen in the exhaust is 8 ppmV), but in case of load

reduction to 50% of the rated electrical efficiency decreases and increases fuel consumption, what lead to the increasing of the emissions for three times;
- the most appropriate for efficient power supply is a gas engine, because of its capability to reduce capacity to 50% at constant efficiency, with a modern system of waste heat source gases, cooling system and system of capturing greenhouse gas emissions (total emissions is 15 ppmV);
- to ensure effective heat load is proposed usage of heat geothermal water and utilized heat from the gas engine;
- usage of these schemes will reduce annual consumption of natural gas to 372,79 m^3 (430,2 tons of the equivalent fuel) and greenhouse gas emissions: CO_2 for 12,35%, NO_x for 7,5%.

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AN INTEGRATED APPROACH TO THE RENEWABLE ENERGY ASSESSMENT

V.A. Staroverova
Saint-Petersburg State University of Refrigeration and Food Engineering, Russia

Actuality for assessing environmental aspects of alternative energy in Russia is due to the fact that development of renewable energy sources (RES) is regarded as one of the strategic directions of the "New Energy Strategy of Russia until 2030". It is expected that the contribution of RES to the country energy balance will be increased up to 4.5% in 2020.

However, despite the active support of the Russian Government, the future development of alternative energy sources is still constrained by rather low technical and economic potentials of renewable energy. In addition, its environmental impact is primarily assessed on the stage of operation, which could lead to suboptimal solutions in the planning of renewable energy.

For this purpose, we propose to consider an integrated approach to the renewable energy assessment based on the life cycle of energy production from RES including all stages, from construction of a wind power unit (including extraction of raw materials, production of intermediate products, construction and transport) till use of equipment (including its energy consumption, transport, maintenance and repairs) and ending with recycling and disposal of waste.

The purpose of this presentation is to determine the environmental aspects of electricity generated from renewable energy sources, based on consideration of the life cycle assessment to select the best technology.

The object of the study is 5 kW wind power plant (WPP) which was produced in Russia. The considered wind turbines can be used by autonomous power consumers, such as households, farms, mini-bakeries and other facilities located in countryside areas.

The subject of the study is assessing the environmental impact and resource efficiency of wind energy at the stages of production, operation, energy distribution and the decommissioning at the end of life.

Comprehensive study of the life cycle of a product or service is necessary because it is not always clear what kind of influence was exerted on the environment during production, and which one at the use stage of the product system.

We suggest the following procedure to choose the best available technology based on renewable energy, which consists of the following basic steps:

1. Data collection and definition of a product system;
2. Inventory of input and output impacts;
3. The balance scheme "costs - release" for materials and energy within the boundaries of the production system;
4. Analysis of input material flows and analysis of resource efficiency of renewable energy production system by its stages;
5. Analysis of the output material flows and determination of significant environmental impact categories;
6. Interpretation of the results;
7. Economic evaluation of RES, and
8. Determining the best available technology of renewable energy.

On the basis of pollutants specific quantities emitted into the air within the life cycle of 1 kW energy power production by the Russian wind turbine VEY-5 the environmental impact categories have been calculated. The calculation was performed using the software LCALtools.

The results are presented at Fig. 1. The maximum contribution to global warming potential (GWP) are making by methane (97.8%). The maximum share of photochemical smog formation belongs to emissions of non-methane hydrocarbons (92.8%).

Since renewable energy sources are still considered to be one of possible directions of the energy supply diversification it is important to use an integrated approach and examine not only environmental but also economic impact of wind energy in comparison with other renewable energy sources.

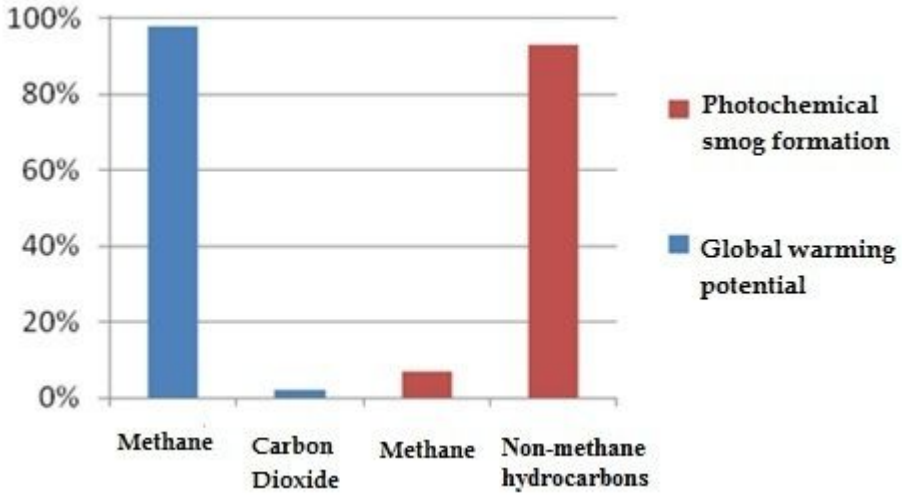

Figure 1. Shares of the pollutant substances within the environmental impact categories in the production of electricity by wind installation type VEY-5

Questions for further research relate to the application of the life cycle cost analysis of wind power units. In conjunction with the analysis of resource efficiency and life cycle assessment this approach can help to make a reasoned decision about the feasibility of using this alternative energy source and to avoid making wrong decisions.

LITHUANIAN WATER-SUPPLY NETS AS AN INDICATOR OF THE ECONOMICAL DEVELOPMENT

Loreta Steponėnaitė
Mykolas Romeris University, Lithuania

Water is known to be vital to humans and it is difficult to find a field in life or activity that does not require water [3]. There are many factors that cause water problems, and their solutions depend on such processes as water management, climatic, social, economical and socio-political conditions and expectations, which influence water planning, development and management processes and their implementation, regulated by legal and regulation systems and influenced by conditions of the country, available and new developing technologies, questions of education and development of the society [1]. Similarly to other European countries, Lithuania also tries to find more efficient solutions. After joining the European Union (EU), it was required to harmonize the national requirements with

the legislation of the EU: the core attention in the water management sector had been given to the implementation of the EU water directives [2]. Thus groundwater protection and quality analysis are especially important, because this water is used for drinking in Lithuania and all fresh water for household and domestic needs in Lithuania is extracted from the underground.

Water-supply nets play one the most significant role in human daily life, and their distribution can show the level of economical development of the country. In Lithuania they influence both making water management decisions and solving economical and social issues. This study aims at examining relations between integration of water-supply nets and economical development of the country. Recent examples of water problems occurring in cities and rural territories are discussed. Moreover, protection of water resources, water quality and aquatic ecosystems is also important as ensuring protection of fresh water resources and their rational use covers comprehensive conformity with the requirements of regulations applied to settlements.

The findings of the study may be useful for raising and answering many questions: is it worthwhile to integrate in water-supply nets and how it can change other processes which strongly influence the society, for example, environmental issues, legislation, and health problems. The results of this analysis can be used nowadays to find reasons of the essential challenges for water management in Lithuania. Management of water resources may be improved considering the processes occurring and applying the principles of sustainable development.

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DEVELOPMENT OF RENT THEORY

Natalia Sydorenko
Sumy State University, Sumy, Ukraine

The simplest definition of rent seeking is the expenditure of resources attempting to enrich oneself by increasing one's share of a fixed amount of wealth

rather than trying to create wealth. Since resources are expended but no new wealth is created, the net effect of rent-seeking is to reduce the sum of social wealth.

Rent-seeking generally implies the extraction of uncompensated value from others without making any contribution to productivity. The origin of the term refers to the gaining control oflandor other pre-existing natural resources. In the modern economy, a more common example of rent-seeking is political lobbying to receive a government transfer payment, or to impose burdensome regulations on one's competitors in order to increase one's market share.

It is important to distinguish between profit-seeking and rent-seeking. Some will try to say that rent-seeking is a creation of wealth. However, profit-seeking should be understood as the creation of wealth, while rent-seeking includes the use of the power of the state or government to distribute wealth between different groups of individuals.

The phenomenon of rent-seeking in connection with monopolies was first formally identified in 1967 by Gordon Tullock. The expression rent-seeking was coined in 1974 by Anne Krueger. The word "rent" does not refer here to payment on a lease but stems instead from Adam Smith's division of incomes into profit, wage, and rent. Rent-seeking behavior is distinguished in theory from profit-seeking behavior, in which entities seek to extract value by engaging in mutually beneficial transactions.

Critics of the concept point out that in practice, there may be difficulties distinguishing between beneficial profit-seeking and detrimental rent-seeking. Often a further distinction is drawn between rents obtained legally through political power and the proceeds of privatecommon-lawcrimessuch as fraud, embezzlementandtheft. This viewpoint sees "profit" as obtained consensually, through a mutually agreeable transaction between two entities (buyer and seller), and the proceeds of common-law crime non-consensually, by force or fraud inflicted on one party by another.

Rent, by contrast with these two, is obtained when a third party deprives one party of access to otherwise accessible transaction opportunities, making nominally "consensual" transactions a rent-collection opportunity for the third party.

From a theoretical standpoint, the moral hazard of rent-seeking can be considerable. If "buying" a favorable regulatory environment is cheaper than building more efficient production, a firm may choose the former option, reaping incomes entirely unrelated to any contribution to total wealth or well-being. This results in a sub-optimal allocation of resources— money spent on lobbyists and counter-lobbyists rather than on research, improved business practices, employee, or additional capital goods— which retards economic growth. Claims that a firm is rent-seeking therefore often accompany allegations of government corruption, or the undue influence of special interests.

Mancur Olson traced the historic consequences of rent seeking in The Rise and Decline of Nations. As a country becomes increasingly dominated by organized interest groups, it loses economic vitality and falls into decline. Olson

argued that countries that have a collapse of the political regime and the interest groups that have coalesced around it can radically improve productivity and increase national income because they start with a clean slate in the aftermath of the collapse. An example of this is Japan after World War Two. But new coalitions form over time, once again shackling society in order to redistribute wealth and income to themselves. However, social and technological changes have allowed new enterprises and groups to emerge in the past.

Rent-seeking behavior, in terms of land rent, figures in Georgist economic theory, where the value of land is largely attributed to provision of government services and infrastructure (e.g., road building, provision of public schools, maintenance of peace and order, etc.) and the community in general, rather than resulting from any action or contribution by the landowner.

A study by Laband and Sophocles in 1988 estimated that rent-seeking had decreased total income in the country by 45 percent ultimately, it is difficult to truly know the cost of rent-seeking, affirmed by both Dougan and Tullock. Rent-seekers of government provided benefits will in turn spend up to that amount of benefit in order to gain those benefits. Similarly, taxpayers lobby for loopholes and will spend the value of those loopholes, again, to obtain those loopholes. The total of wastes from rent-seeking is the total amount from the government provided benefits and instances of tax avoidance. Dougan says that the "total rent-seeking costs equal the sum of aggregate current income plus the net deficit of the public sector."

Mark Gradstein writes about rent-seeking in relation to public goods provision, and says that public goods are determined by rent seeking or lobbying activities. But the question is whether private provision with free-riding incentives or public provision with rent-seeking incentives is more inefficient in its allocation.

Rent-seeking can also be quite costly to economic growth. This is because high rent-seeking activity makes more rent-seeking attractive because of the natural and growing returns that one sees as a result of rent-seeking. Thus, rent-seeking is valued over productivity. In this case there are very high levels of rent-seeking, while very low levels of output. Another reason rent-seeking may grow at the cost of economic growth, is that public rent-seeking by the state can so easily hurt innovation. Ultimately, public rent-seeking hurts the economy the most because innovation is what drives economic growth.

PROGRESS TRENDS OF WIND ENERGY IN NEPAL

Amrita Tamang
Kharkov National University of Radioelectonic

Alternative Energy Promotion Centre (AEPC) is a Government institution established on November 3, 1996 under the then Ministry of Science and

Technology with the objective of developing and promoting renewable/alternative energy technologies in Nepal. Currently, it is under Ministry of Environment. It functions independently, and has a nine member board with representatives from government sector, industry sector and non-governmental organizations.

The mission of AEPC is to make renewable energy mainstream resource through increased access, knowledge and adaptability contributing for the improved living conditions of people in Nepal. An institution recognized as a regional/international example of promoting large-scale use of renewable energy sustainable and a national focal point for resource mobilization". The focus is to make AEPC recognized as an active institution promoting Renewable Energy Technology (RET) in the region.

Subsidy Disbursement Status of SHS & SSHS

Activity	Target for FY 2010/11	Amount, NPR
Solar Home Systems (SHS)	80,000	640,000,000
Subsidy Disbursement till 1/07/2011 to 31/01/2012	25,025	205,971,000
Balance	**54,975**	**434,029,000**
Small Solar Home Systems (SSHS)	25,000	50,000,000
Subsidy Disbursement till 1/07/2011 to 31/01/2012	5,224	10,448,000
Balance	**19,776**	**39,552,000**
PV Pumping Systems	25	25,000,000
Subsidy Disbursement till 1/07/2011 to 30/11/2011	-	-
Balance	**25**	**25,000,000**

Towards the end of 20th and beginning of the 21st centuries, interest has risen in new and renewable energy (RE) sources especially wind energy for electricity generation. The scientists and researchers attempted to accelerate solutions for wind energy generation design parameters. Our life is directly related to energy and its consumption, and the issues of energy research are extremely important and highly sensitive. In a short time, wind energy is welcomed by society, industry and politics as a clean, practical, economical and environmentally friendly alternative.

After the 1973 oil crisis, the RE sources started to appear in the agenda and hence the wind energy gained significant interest. As a result of extensive studies on this topic, wind energy has recently been applied in various industries, and it started to compete with other energy resources. In this paper, wind energy is reviewed and opened for further discussion. Wind energy history, wind-power meteorology, the energy climate relations, wind-turbine technology, wind economy, wind hybrid applications and the current status of installed wind energy capacity all over the world reviewed critically with further enhancements and new research trend direction suggestions

Modern power generative technologies are oriented mainly on incineration of the fossil fuel accumulated by nature for a long period of time. Many Nepalies counted, that such way brings humanity over to the catastrophic consequences, shown above all things in formation of environment useless for life. Very big

interest appears to the untraditional sources of receipt of energy, including winding energy.

For the modern technical level of wind energetic options we can use districts with average annual speeds of wind 5 m/s. Therefore the preliminary estimate of wind descriptions of territory of Nepal is given with use of this criterion. 214 weather-stations for a long period of time testify the analysis of these long-term supervisions that in Nepal winds prevail from 0-5 m/s. But experience showed that data was given about average annual speed of wind, got the weather-stations of Nepal, useless for production of electric power by windy power-stations, because there error very often makes 40-70%/ General power of perspective wind power station. Nepal is estimate in 16000 megawatt with the possible annual making of electric power about 30 billion kilowatt-hour.

As for a legal base, on June, 15, 1994 Cabinet of Minister of Nepal adopted the decision. 415 "About building of wind power-stations in Nepal", and on March, 2, 1996 Decree of President of Nepal was accepted 159/96 with the same name, which formed the special fund of building of wind power stations, due to the increase of tariff on electric power in a size 0.75% from the volume of commodity products of production of electric power.

Development of wind energetic of Nepal supports Law of Nepal "About of electro energy", Law of Nepal "About energy supply", Law of Nepal "About alternative energy sources". After average speeds of wind - 5 m/s, it is possible to select 6 districts (Pokhara , Dhangadhi, Bhaktapur, Biratangar, Nepalgunj) and 2

areas (Kathmandu, Dharan). There are such wind power stations in Nepal: Laakuri Bhanjyaang, Lalitpur and Bhaktapur, Bihar, and also of the stage

of planning — Western- Kathmandu, Pokhara , Near Tibet, Laakuri and other.

Special researches with the purpose of estimation of public thought in behalf

of introduction of wind energetic in Nepal were not conducted. But events of 53

negative plan for all active period, beginning with 1989, place does not take any action.

And judging on the publications in mass Medias, it is possible to do a conclusion about positive perception of this direction. Positive argumentation is based on: receipt of electric power; improvement of ecological situation; creation of alternative to the nuclear power plants; creation of new workplaces. However, there are three fundamental problems in relation to development of wind energetic crisis of economy; unfavorable character of influencing of legislative base; imperfect organizational structure.

INTRODUCING THE SCIENCE OF BIODIVERSITY CONSERVATION TO UKRAINIAN UNIVERSITIES

Olena Tarasova
National University of Kyiv-Mohyla Academy

Humans depend on the services and goods provided by the Earth's ecosystems. Everything we obtain from nature — food, water, building materials, spiritual renewal, — together represents the goods and services of nature. According to Millennium Ecosystem Assessment findings [1] humans have changed ecosystems more rapidly and extensively over the past 50 years than at during any comparable period of time in human history. Moreover, approximately 60% of ecosystem services considered by the Millennium Ecosystem Assessment were degraded or being used unsustainably [1], including 70% of regulating and cultural services.

The key components of ecosystem services are genes, species and ecosystems [2]. Forty years ago biodiversity conservation was perceived around the world as simply the conservation of endangered species.

However, "biodiversity" is much broader than just species, endangered or not. As defined by Convention on Biological Diversity [3] biodiversity is "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." A more succinct definition is provided by Harrison et al. [4] as "the variety of life on Earth at all its levels, from genes to ecosystems, and the ecological and evolutionary processes that sustain it."

Conservation of biodiversity is an aim of the applied and nascent science of conservation biology, which combines theoretical knowledge in biology and ecology with practice and policy. As a science conservation biology began in 1978 at the First Conference in San Diego at University of California. Conservation biology differs from other disciplines in several ways. First, it is a crisis science insofar as it requires immediate actions even in case of potential threat to prevent negative consequences of loss of biodiversity in the future [5]. Second, it is an interdisciplinary science as that integrates sociology, economics, policy, communications and other fields to inform decision-making to enable biodiversity conservation. Third, it is an applied science that develops methods, approaches, and tools for protection of life on the Earth in all its forms [6].

Ukraine is biodiverse country. However, the future of the region's biodiversity is uncertain. For many years conservation initiatives have relied on local enthusiasts or biologists who were not trained as conservation biologists. Moreover, conservation biology has not been perceived as a respectable topic worthy of attention by scientists nor one that would benefit from a scientific approach. For these reasons and the related lack of expertise and financial

resources, biodiversity conservation has not been included into the system of higher education in Ukraine. Consequently there is a lack of trained experts in conservation science in the country today. Therefore among many other challenges that the country now faces, Ukraine urgently requires trained biodiversity conservation professionals to implement goals that have been defined by *National Strategy for Environmental Policy in Ukraine* to 2020 and *National Action Plan for Environmental Protection in Ukraine* for 2011-2015. As opportunities and resources for academic and professional training in conservation are limited in availability and scope in Ukraine, it is crucial at this time to introduce to institutions of higher learning to the science of conservation biology.

According to the personal discussion with the representative at the Ministry of Education and Science, Youth and Sport of Ukraine as of nineteenth of March 2012 there are no separate biodiversity conservation course in Ukraine as for today. It is included as a rule as a separate module to the "Ecology" course. The new Master program "Protected Area Management" has been developed but has not been yet introduced to any University in Ukraine.

One first attempt to introduce science of biodiversity conservation into the Ukrainian higher education system involved an "Ecology" course for 1st year Master Degree students at National University of Kyiv-Mohyla Academy. Modules that included lectures, seminars, case studies and lectures were developed based on the experience of teaching conservation biology in Great Britain and the United States using materials developed by Network of Conservation Education Practitioners (http://ncep.amnh.org/). The course is a significant supplement to the curriculum of the program of Ecology, Environmental Protection and Sustainable Management.

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WASTE EXCHANGES

Kateryna Tereschenko
Sumy State University, Ukraine

Money is a stronger motivator for actions than caring about pollution. If there had not been any state or interstate regulations like paying money for violations of the standards and laws, mankind would poison itself more intensively. Saving on fines and possible benefits from utilization and selling waste for recycling pushed to the appearance of such infrastructural elements like waste exchange.

Waste exchanges that appeared at the market over 60 years ago today play a significant role in formation of global ecologically clean economy.

With every year growth of the recycling secondary raw materials and industry wastes plays an increasing role in global economy. According to the experts, on the average over a half of world balance of the raw materials is secondary raw materials, in the developed countries it reaches 70 %. Today more than 1,5 million people are occupied in this industry; about 600 million tons of secondary raw materials are recycled per year for total amount over 160 billion US dollars.

One of problems that enterprises of the recycling industry have is search for suppliers. For many years in the developed countries the waste exchanges help to solve this problem. The principle is put in a basis of their functioning: « unnecessary waste for one business is valuable raw material for another». Its main function is providing a platform, on which companies having unnecessary, but potentially recycled waste, or a waste which can be reused, could meet buyers of this waste.

Main goals of the modern western waste exchanges are encouragement of trade in industry wastes for the purpose of their recycling or reusing with a view of rational use of natural resources, reduction of health hazard of the population, and also decreasing influence on the environment. The last is expressed in reduction of quantity of raw materials that finishes its production cycle on dumps of industrial and household garbage.

Besides the main purpose, the waste exchanges carry out a number of supportive functions, such as providing information on recycling or reusing these or those types of industrial wastes; granting possibility for reuse of an industrial waste with low commercial cost, and also utilization of the difficult, unusual, non-standard, polluted waste. They also assist in recycling of small firms and companies, in development of new markets for industrial wastes.

Experts agree in opinion that the most valuable component in work of the waste exchanges is its function of provider market information of waste market conditions and recycling. The most western waste exchanges are represented today by the electronic trading platforms publishing lists of offered and demanded

secondary raw materials. Usually the lists consist of 10 - 15 types of industrial wastes. The structure of the list can vary depending on a geographical position of the exchange and structure of industries in this location. For recycling plastic products are offered usually, then paper and cardboard follow. On the third place of popularity sellers have wood wastes.

Wood and plastic wastes are of the greatest demand, then metal and paper wastes go. The peculiarity of lists of the majority of waste exchanges is that on the majority of positions the offer of wastes exceeds demand for them, sometimes more than twice. Among groups in which demand is approximately equal to the offer are computers, electronics and office equipment, industrial oils, and also organic wastes (first of all wastes of productions on agricultural products recycling).

Why is support of the western waste exchanges is profitable for the authorities both on state and on local levels? First of all the exchange is cheap, but a highly effective way of ecological, nature protection and resource-saving promotion. In addition, waste exchanges bring to local economy quite notable financial profit through building of the new recycling industries and also economy of budgetary funds on construction new and maintenance of old dumps and plants on utilization (for example burning) of wastes.

Besides, by creation of the waste exchanges the authorities show local businesses the readiness to work with them over measures for reduction of nature protection tax burden, and also for adaptation to environmental standards that are becoming tougher.

Opening of universal national information systems and increasing number of the national and local exchanges through them is a way on which formation of the waste exchange market should be performed in developing countries.

For the countries in which the system of waste exchanges is not created yet, experts recommend to begin preparation for its creation with increase of ecological literacy of government officials and local business elite. They should know how this nature protection mechanism works, and to understand that its high-grade work is impossible without support of big business, and first of all the government.

For Ukraine with its difficult ecological situation and absence of necessary number of waste recycling plants, the problem of waste recycling is very important. Considering it creation of waste exchanges would give opportunity for the solution of many environmental issues. Governmental financing and support of local authorities are necessary for creation of the similar exchanges. The private capital also should participate in this process. The first waste exchanges in Ukraine could be created at social - enterprise corporations, and then in each region.

SELF-MANAGEMENT IN ECOLOGICAL AND ECONOMICAL SYSTEMS

Irina Tereshchenko
Sumy State University

The current system of nature includes two independent systems: material production and environmental protection.

Ecological and economical system (EES) can be defined as the integration of economy and nature, which are interrelated in social production and flow processes in nature and biosphere.

The main properties of EES can provide balance, proportion and balance production and natural components of the system.

Designated properties include maintaining the balance of these subsystems, which precludes their selfdamage.

The economic system is organized totality of productive forces, which converts the input material and energy flows of natural and industrial resources in the input stream consumption. That is, some components of ecological systems use economic system. Thus, ecological and economic systems associated with mutual material and energy flows.

Investigation of the term EES is based on the concept of general systems theory. Using a systematic approach it should be based on close relations and integration processes of EES. Investigation of EES operation requires a comprehensive analysis of effects of self-discovery processes and management opportunities.

The development of EES is subject to general laws of self-organization, characterized by the following features:

1) self-organizing, can change the characteristics of their parameters, structure, functional relationships, depending on external conditions so that the entropy of the system decreased or remained unchanged level;

2) operation processes in EES aimed to improve the efficiency (productivity, product quality), while reducing energy consumption, which is a factor of reducing ecological and environmental impact and therefore achieve balance and sustainability of EES;

3) processes that occur in systems of self-organizing aimed at self-preservation and self-healing.

Operation of EES systems should be defined by the volume of energy and matter that generated them at this time.

The research aspects of formation and development of ecological-economic systems allows to make the following conclusions:

• system-factor in the EES is the presence of interconnections and interdependence of ecological and economic subsystems;

• EES brings together a great number of elements that interact to reach a goal - sustainable environmental and economic development.

POLISH ENERGY SECTOR IN ORDER TO REACHING THE STANDINGS OF EUROPEAN UNION CLIMATE AND ENERGY POLICY

Tomasz Tomczak, Albert Daros, Karolina Tomczyk, Krystian Cieciura
Students' Scientific Association EKOBIZNES,
University of Lodz, Lodz, Poland

The economic development of European Union countries is getting faster. Therefore the demand for energy is rising as well, and such a situation is connected with necessity of investing in energy sector and research for a new solutions to guarantee an energy security of EU. However, despite the many benefits and strategic position in the European Union policies, this sector is one that cause the greatest pressure on the environment. Emitted pollutants can lead to irreversible changes in climate and environment. Such situation may for example result in raising level of water, climate warming and the changing conditions of agricultural crops. Despite of restrictive EU ecological law, it turn out to be insufficient. Many of forecasts appeared that if the EU fails to make changes in the structure of energy production and the infrastructure quality will not change, it will cause further growth in CO_2 emissions and other pollutants. As a result of forecasts presented at the European Council on 11-12 December 2008, EU countries adopted the "Climate and Energy Package", otherwise known as "Package 3x20". Therefore, the European Union countries will have to face many new challenges in the coming years, caused by the adoption of the package. This will mean the necessity of change the structure of investment in member countries and transfer of funds for investment in renewable sources of energy and modernization of already existing plants to reduce emissions by 2020. Because of the Polish membership in the European Union since 2004, it is required to fulfill the provisions of the climate-energy package, which assume[3]:

1. 20% reduction in greenhouse gas emissions, including CO_2 by 2020 and aspiration to achieve reductions of 50% in 2050 compared to 1990.
2. Share of energy from renewable sources in total consumption is expected to be 15% by 2020 (for the rest of the EU 20%), due to lower efficiency and the amount of renewable energy resources.
3. Energy efficiency growth by 20% by reducing the final energy use by 2020.
4. The increase of biofuels to 10% of total consumption of transport fuels by 2020.

The provisions of the package for the Polish energy sector raises a lot of controversy. Optimists says that those provisions are achievable and will give an

[3] Op. Cit. *„Potencjał efektywności energetycznej…”*, 9-13

impulse to growth of polish economy and also diversification of energy sources. In addition, the goals of the package are complementary, which means that they have mutual influence on each other. However, among the approaches is pessimistic forecast that these requirements are unrealistic, because of an excessive burden for the country's economy in short term.

From among all the goals that Poland is obliged to meet, the most reliable to fulfill seems to be the order 4 – increase the share of biofuels to 10% of the total consumption of transport fuels by 2020. According to projections conducted for the "Energy Policy", by the Ministry of Economy in 2020 Poland will reach 10% biofuels share of transport, while in 2030 it is estimated that this figure will reach 10.4%[4]. In 2020, a significant share of the biofuels will be biodiesel from rapeseed (48.2%) and biodiesel sugar-starch (29.4%). Compared to 2010 it would constitute a double and a triple increase in biofuels from this source. In 2010 the consumption of transport biofuels have a value of 549 ktoe, while by 2020, according to forecasts made by the Ministry of Economy should be at 1444.1 ktoe[5].

Another objective to be analyzed is a 20% reduction in greenhouse gas emissions, including CO_2 by the year 2020 according to the year 1990 and increase renewable energy to 15% of its total consumption by 2020. Polish energy sector is based mainly on power generated from conventional fuels, mainly coal and brown coal. Indeed, the primary energy production from these sources in 2009 accounted for almost 92% of the total energy produced[6]. It should also be noted that coal-fired plants are a strategic resource to ensure the energy security of Poland, because it is dependent on energy imports only 25.5%, while the average EU-27 is 53.1%[7]. However, if Poland still wants to use coal technology it is needed to thorough modernization in order to reduce and prevent emissions of harmful pollutants and dust emissions, including CO_2.

Unfortunately, the Polish energy sector is operated by the infrastructure with long term life cycle. Because of it over the years, a national "energy mix" transformation is very slowly[8]. As mentioned above, coal energy has strategic importance in the national economy, and therefore it seems obvious that in the next few years it will play a leading role, in spite of its total share will be reduced at the expense of renewable energy sources. The process of ensuring energy security and concern about climate change will force the continued development of large-scale coal-fired plants, it is also necessary to invest in their modernization, and

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[4] *Prognoza zapotrzebowania na paliwa i energię do 2030 roku"*, Ministerstwo Gospodarki, Warszawa 2009, s. 11-13

[5] Tamże, s. 11-13

[6] http://www.cire.pl

[7] http://epp.eurostat.ec.europa.eu

[8] Pawlik M. *„Krajowy sektor elektroenergetyczny wobec wyzwań pakietu klimatyczno-energetycznego UE"*, XXXII Międzynarodowa Konferencja ekologiczna *„Wytwarzanie energii elektrycznej i ciepła w aspekcie pakietu Klimatycznego UE- stosowane technologie i zagrożenia"*, Łódź 24- 25 Czerwiec 2010, s. 7-14

construction of modern buildings using the latest carbon-free or low-carbon technologies.

Over the nearly 20 years the Polish power plant construction industry was in recession[9]. Last major investment was in 1997 when it was completed in block No. 4 Opole Power Plant with a capacity of 360 MW. Only in 2008 was put to use supercritical unit with a capacity of 464 MW in Pątnów[10]. In 2009 construction of another block having a supercritical CFB boiler burning bituminous coal (the biggest in the world) has been finished at Łagisza Power Plant[11]. Work is still in progress on construction of the country's largest supercritical unit with a capacity of 858 MW lignite-fired power station in Bełchatów[12]. It can be concluded that the Polish coal-fired power, although with considerable delay, implement new technologies based on supercritical steam parameters. However, long periods of the above investments, including new generating capacity meant that they are not as modern as they were when the investment begun.

According to the decisions of the package, carbon dioxide emissions should be reduced by 20%, which means up to 120 million tonnes. This means that achieving the targets of the package will require an establishment of gross energy production from renewable sources in 2020 to almost 31 TWh (30.1 TWh net), which equates to 18.4% (19.3% net) of the total production gross electricity in the country this year - 168.5 TWh (156.1 TWh).

It is forecasted that in the perspective of 2020, demand for electricity will increase to the level of 170 TWh. This analysis shows the possibility of production of energy without CO_2 emissions to achieve emission levels equivalent to 120 million tonnes. As indicated by the forecast, there are several options for achieving such a state (Table 1). Under the scheme, for example for a 10% share of energy without CO_2 emissions is the production of close to an optional 144 TWh of electricity from new high-efficiency coal blocks with supercritical parameters.

This means We need to achieve a 16.23 GW of installed capacity from this source. The dominant role in diversification of the national "energymix" have classified as sources Without missionary (RES and nuclear energy), their share increases with the transition to cleaner energy sources. In the case of to achieving the 20% energy without emissions, will require modernization of existing facilities, and production of energy from this source of nearly 80 TWh. In this case, as compared to the previously described scheme decreases almost by half (to 47.68 TWh), the share of new high-efficiency coal-fired plant. This means you need to install 6.81 GW of new power

[9] Tamże, s. 7-14

[10] Tamże, s. 7-14

[11] Tamże, s. 7-14

[12] Pawlik M. *„Nowe moce wytwórcze w Polsce w świetle unijnych regulacji”*, artykuł opublikowany w czasopiśmie *:Energetyka”*, nr 9/2010

Table 1 – Structure of the Polish Energy in 2020, according to the share without emission energy sources.

Production of electricity by. sources (TWh)	The share of energy without CO_2 emissions			
	10%	15%	20%	25%
existing installations	30,86	55,34	79,82	104,3
new installations	113,64	80,66	47,68	14,7
Power plants without emissions	17	25,5	34	42,5
gas power plants	8,5	8,5	8,5	8,5
TOTAL	170	170	170	170

Achieving the 20% carbon-free energy production is realistic, if Poland will have access to nuclear energy. One option is to build the first nuclear power plant in our country by 2020. In case of failure to execute the planned construction of such a facility, it is possible to purchase energy from this source in Lithuania (Ignalina NPP), or from the planned and approved to build a nuclear power plant in Kaliningrad.[11] As regards the installation of 6.81 GW in high and new coal power plants, it is achievable.[12] Determinant of this state is able to obtain the objects of free emission allowances after 2013.

Experts estimate that by 2020 will be installed from 7 thousand. to 11 thousand. MW of power which is generated by wind turbines.[13] However, according to the Polish Wind Energy Association, an installed capacity of wind in 2020 is estimated to be up to nearly 13 thousand. MW.[14] This means that the increase in electricity production from this source of 12.5 - 17.5 TWh per year, depending on the degree of implementation of plans.

However, one of the most promising technologies for capturing the "green" energy in Poland is biomass, defined as wood waste from forestry production, and waste from industrial production and forestry and energy crops.[15] More and more interest in Poland has a technology that is co-firing biomass with coal in existing power boilers.[16] This technology is implemented in nearly 20 domestic power plants and power plants. It is estimated that the use of about 1 million hectares of wasteland for agricultural domestic production of energy crops, which would be used for biogas production will reach a level close to 60 TWh of energy in the

[11] Op. Cit. Pawlik M. *„Nowe moce wytwórcze…”*

[12] Op. Cit. Pawlik M. *„Krajowy sektor elektroenergetyczny…”*, s. 7-14

[13] Tamże, s. 7-14

[14] *„Ocena możliwości rozwoju i potencjału energetyki wiatrowej w Polsce do roku 2020”*, Polskie Stowarzyszenie Energii Wiatrowej, raport zamieszczony na stronie www.psew.pl, s. 6

[15] *„National Renewable Energy Action Plan”*, Minister of Economy, Warsaw 2010, s. 114-124

[16] Op. Cit. Pawlik M. *„Nowe moce wytwórcze…”*

primary fuel.[17] In addition, in 2009, the Ministry of Economy has adopted the program "Innovative Energy-Energy Agriculture." It envisages construction of a biogas plant on average in each municipality in the Republic until 2020.[18] This means you can acquire an additional 10 TWh of electricity from renewable sources. It is therefore important to intensify the cooperation between producers of biomass and electricity sector.

Poland is on its way to complete foundation package of both CO2 emissions and the share of renewables in the national "energy mix".

The last of the requirements of climate and energy package is to increase energy efficiency by 20% by reducing the final energy use by 2020.

During the last 10 years in Poland can be seen significant progress in the field of energy efficiency. Energy intensity of GDP has fallen since about 30% (Fig. 19). It is the merit of the projects in the field of thermal performed under the Act on supporting thermal modernization, as well as through the upgrading of street lighting and optimization of industrial processes. Despite this efficiency of the Polish economy is still almost three times lower than most developed European countries and 2 times lower than the average of the EU[19] countries. In addition, primary energy consumption in Poland, related to the size of the population is almost 40% lower than in EU-15th This demonstrates the high potential in terms of saving energy in Poland, which is characteristic of fast growing economy.

To sum up The Polish economy is on track to meet the requirements of climate and energy package. Any predictions made by the Government show that these targets will be met. It also shows an increase of investments in the energy sector aimed at increasing the share of renewables in total energy production and reduce carbon emissions. Analyses indicate that in subsequent years the Polish "energy mix" will continue to dominate the energy from conventional sources, however, be helped by coal power plants with supercritical parameters, and to a large extent by renewable energy sources (mainly wind and biomass). Although the trend in energy consumption is growing for several years, Poland from one year to reduce energy consumption in the economy. If the assumptions set out projections are met, Poland will be ready to meet the provision of energy and climate package on energy efficiency.

[17] Tamże

[18] Op. Cit. Pawlik M. *„Krajowy sektor elektroenergetyczny…”*, s. 7-14

[19] http://www.mg.gov.pl

THE USE OF RAPESEED AS A BIOFUELS IN THE KALININGRAD REGION

Anna Usenok, Andrey Tsymbal
BFFSA, Russia

Bioenergy - an independent branch of a great power, it occupies a prominent place in world production of heat, electricity and biofuels. The leading countries of the world pay much attention to renewable energy sources (RES), derived from plant material, including biodiesel. The use of renewable energy also corresponds to the modern Russia's energy strategy.

A. Biodiesel - a methyl ester, obtained by chemical reaction of vegetable oils and animal fats, in particular from rapeseed.

Biodiesel has good lubricity than favorably with diesel fuel. It prolongs the life of the engine, removing deposits of oil in its detail. In addition, biofuels are significantly cleaner than diesel: emissions of carbon black is less than 50% of CO (carbon monoxide) - by 10-12%, CH (hydrocarbon) - 20%, the content of SO2 (sulfur dioxide) in the exhaust - 0.005-0.05 % vs. 0.2-0.5% for diesel fuel. Due to the high oxygen content in biodiesel (10%) in the exhaust gases of a car more nitrogen oxides. But this figure is reduced to normal in the right mood of the fuel system.

That is why it is important to evaluate the potential of rapeseed based employment area, yield and quality of rapeseed oil produced in the production of biodiesel.

B. The prospect of using rapeseed as a biofuel. The Kaliningrad region (estimated at the Ministry of Agriculture) is positioned as the region is actively sow rapeseed. The highest yield was 33.4 t / ha. Favorable economic conditions makes it possible to supply a raw material for production of biofuels and biofuel ready to European countries that are major consumers of biodiesel and biobutanol.

Rapeseed is grown in all 13 districts of the region an area of 34.9 ha (2010).

Biodiesel production in the Kaliningrad region (in 2011) is about 32.5 tons / year - 1200.5 TJ / year. In 2011, SO2 emissions in 1261 decreased to r, CO - 79.3 thousand tons.

The number of diesel fuel consumed annually is increasing (in 2010 - 183.7 thousand tons). Thus it is possible to improve the power supply area and the ecological situation in the region. Total emissions of pollutants from motor vehicles in 2010 amounted to 119.34 thousand tons, of which use diesel fuel -10.88 tons (10%).

In the emissions from the combustion of biodiesel is practically no sulfur, so they are equal to zero. When accounting for CO_2 emissions from renewable fuels are zero, because unlike fossil fuels, the combustion of biodiesel does not increase

the percentage of CO_2 in the atmosphere. Reducing CO_2 emissions by using biodiesel in the Kaliningrad region is 62.0 tons / year (Table 1).

Table 1 – Reducing emissions of CO_2 and SO_2 in the use of biodiesel in the Kaliningrad region in 2010.

The number of biodiesel fuel, thousands of tons	Sown area of thousands of hectares	The potential energy of the biodiesel TJ (T = =1012)	The equivalent of diesel fuel, thousands of tons	Emissions from biodiesel, thousands of tons		Emissions from diesel fuel, thousands of tons		Reducing emissions of thousands of tons / year	
				CO_2	SO_2	CO_2	SO_2	CO_2	SO_2
32,5	34,9	1293,5	30,5	30	0	92,0	0,122	62,0	0,122

In line with the target program "The main directions of development of agriculture of the Kaliningrad region for 2007-2016." potentially possible area under rapeseed may be 107.5 thousand hectares. This means that bio-energy potential of the region will increase significantly. If the yield of rapeseed in 2016 to take about 30 kg / ha, the yield of biodiesel is equal to 94.8 tons.

C. The negative effects. The technology allows for rapeseed 2-3-one-time processing of crops with pesticides by aircraft during the flowering plants. While rapeseed is pollinated by insects, honeybees, which are destroyed in large numbers. And as the wind carries pesticides on crops adjacent to the rapeseed area of human settlements, water and pastures. They fall in food animals, the human body, along with milk, meat, vegetables and water.

Nowadays sown oilseed rapeseed is given a quarter of agricultural land.

Due to the increasing demand for biodiesel requires more acreage for rapeseed, therefore, deforestation, land use of food crops. This situation could have unpredictable consequences, and threatens food and environmental security of the planet.

Only an integrated, scientific approach to the problem can bring results. Otherwise we will have and the food, and environmental and energy crisis.

D. Economic effect.

Return to the Kaliningrad region of rapeseed in 2011 ranked third. At the same time, the profitability of oilseed rapeseed was much higher in comparison with the grain, and was - 25.9%, respectively. In 2009, the margin was 23.8%.

At the same time dependence of the value of biodiesel and diesel: biodiesel B100 – 600 € per ton., diesel - 775€. The benefits of biofuels: to reduce emissions, improved fuel lubricity, the ability of the natural decomposition when pouring fuel.

Using the potential of biodiesel can improve not only the energy security of the region, but also its ecological environment, as biodiesel can be used for automotive vehicles, in taxis and public transport, the Kaliningrad region.

THE REVIEW OF WATER MANAGEMENT IN AFRICA

Nataliya Vernydub, Victor Ebiziem
Sumy State University, Ukraine

Attitudes to water resource management in both developed and developing world have undergone major reversals in the twentieth century. In the first half of the century, the construction of water wells and boreholes, although apparently justifiable economically, was also seen as something of a challenge in engineering terms, nature was subdued and human prosperity resulted. It is crucial to understand both actual water control projects and the basis for decisions in water resource management in Africa that will affect people's lives in the future.

In view of this, globally, almost 1.9 million children die each year from diarrheal diseases caused by unsafe drinking water, inadequate sanitation facilities and poor hygiene each year. It is the second largest cause of child mortality, after respiratory infections, accounting for 15 percent of child deaths globally, and 18 percent of child deaths in the poorest countries. Chronic diarrhea in early childhood contributes to decreased food intake and nutrient absorption, malnutrition, reduced resistance to infection, and impaired physical growth and cognitive development, with long-term consequences for educational attainment and income.

This research is being focused on the management of water in Africa. Taking Africa as our case study helps us and the world to know how we have been losing life and how also we can save life.

Water reforms in Southern Africa in general and in Zimbabwe in particular constitute a relevant site to examine the strengths and weaknesses of political ecology. Water management, policiesand reform reflect a combination of historical ideas and practices grafted onto the new globalstrategy for converting water from a free public good to an economic one.

In the emergentglobal discourses, and particularly in the public sphere, in contrast to professional and scientificones, equal attention is paid to the essential nature of water for all life and to water as aneconomic good. The complex interplay surrounding this essential "natural" resource lends itselfto political ecological analyses. Environmental anthropologists must necessarily start from observations of ecological change.One of the strengths of political ecology is its focus on the mutual constitution of social andenvironmental change. In our research, we have begun by focusing on the social, political andpolicy dimensions of the water reform process, with the goal of examining the social

andenvironmental consequences of such changes, if indeed any result from the reforms.

Only 4 per cent of the continent's available fresh water is currently being used. With the new Partnership for Africa's Development (NEPAD), and through their support for the Millennium Development Goals (MDGs), which were adopted by world leaders in 2000. The seventh MDG is to cut in half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. In sub-Saharan Africa, that proportion was reduced from 52 per cent to 44 per cent between 1990 and 2004. But the target, 26 per cent, still remains very distant.

Few countries in Africa now can pose of new water like Senegal, Gabon, Uganda and South Africa, are significantly increasing the number of new water connections in the continent. Access to water looks different in every country. It could mean pipes into homes, or a well, 30 minutes away. It is no longer news about what is happening in Niger Delta area of Nigeria scoop oil to have water for survival this was cause by the technical and equipment failure that led to crude oil spillages with environmental degradation and pollution.

But no matter the standards set by a country, access to clean drinking water and proper sanitation are crucial human rights, because without these, people are forced to rely on unsafe sources for water, which highly increases the risk for preventable, communicable diseases. As a result of inadequate resources, families are stuck in a cycle of ill health and poverty, which affect children most severely. The UN has deemed this crisis the "silent emergency" because unsafe water supply, lack of proper sanitation and improper hygiene are the cause of over 3.5 million deaths a year, and 84% of those deaths are children. We also have to take a look towards the water crisis in Kenya where only 9 out of 55 water service providers supplies water continuously under 14 hours on average in 55 water utilities. Lack of improved sanitation has caused unsafe drinking water, in the urban an additional 51% of the population used latrines while in the rural areas open defecation was estimated to be practiced by 18% of the population which pose danger to the management of the water.

Furthermore, a new technology, the dispenser, is designed to fill this gap and provide a sponsored water treatment solution for use in poor areas where take-up of water treatment products is low and where the water borne illness burden is severe. Africa is a developing continent with a low technology, so in order to save life and to manage water they resolve to the water dispenser treatment.

The dispenser system includes a simple, low-cost water treatment technology that has achieved remarkable and sustained use in Kenya. The innovative dispenser is filled with dilute chlorine and placed near a communal water source, allowing individual users to treat their water with the correct dose of chlorine in their jerricans after it has been collected from the source.

The future of water management in Africa seems to depend as much on the internal and international politics of Africa as upon objective development

planning. If the ecological lobby gains the upper hand in the most senior echelons of the administration, and if their influence outlasts the transition to civilian power, then the wetlands and their associated productive systems may be saved.

INTERNATIONAL CLEAN TECHNOLOGY TRANSFER

Nataliya Vernydub, Vitaliy Omelyanenko
Sumy State University, Sumy, Ukraine

Establishing a framework to facilitate the transfer of clean technologies from developed countries to developing countries is one of the most challenging tasks that the international community.

Technology transfer is included in both the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. Article 4.1 of the Convention requires all Parties to promote and cooperate in the development, application and diffusion, including transfer, of GHG mitigation technologies. Articles 4.3 and 4.5 stipulate that developed country Parties should provide additional financial resources to support the transfer of technology and take all practicable steps to promote, facilitate and finance the transfer of, or access to, environmentally sound technologies and know-how to developing country Parties. EU also hopes to use the sectoral mechanism as a means of facilitating technology transfer from industrialized countries to the developing world (EurActiv 16/10/09).

According to the International Council for High Technology (2003, Geneva) to the list of high-tech concerns group "Clean Technology and Alternative Energy", which includes recycling, nuclear energy, solar energy, hydrogen energy, energy saving technologies. Inclusion of these groups, despite some not corresponding to the criterion of knowledge-intensive and the cost of research and development in production costs due to the importance of these areas for global development.Green technologies cover a broad range of fundamentally different types of innovation, including alternative energy resources, technologies employing alternative energy sources, energy storage, distribution and management technologies, recycling and waste technologies, industrial processes, and technologies for capture, storage, and sequestration or disposal of greenhouse gases. The underlying technology behind green innovations differ greatly, and range from high-tech innovation such as genetically modified crops to low-tech innovations such as mechanical farming techniques. These technologies differ in other ways as well, for example the fixed costs of innovation and adoption involved and their applicability across industries and climatic zones.

According to classic economic theory, market forces provide insufficient incentives for investment in the development of climate-friendly technologies. The cost of carbon emissions associated with the production of goods is not normally included in their price, so neither firms nor consumers have any incentive to reduce

emissions. Technologies with benefits that are immediately apparent to the consumer are exceptions: for example, when people switch to more fuel-efficient cars, they can cut their gasoline costs, although they are not rewarded monetarily for the emissions-saving benefits of their actions.

Technology transfer in the international context commonly refers to sale or licensing of intellectual property, but the term includes any process by which users in one country gain access to and utilizes technology developed in another country. The term technology implies any practical application of knowledge in a particular area, but it is usually associated with machines and related infrastructure, and technology is often discussed in this constricted sense. This narrow viewcombined with developing countries' large-scale import of knowledge based machinery, products, and process licenses creates the perception of developing countries as technology users" and "passive recipients" of developed country technologies.As poorer countries develop economically, their ecological footprint will grow. Developing countries will need clean technologies, if they are to play an active role in combating climate change. These mechanismlies in genuine cooperative technology transfer between the developed and developing world.

As the developed world begins efforts to limit its emissions of greenhouse gases, economic growth in developing countries is causing increased emissions from the developing world. Reducing these emissions while still enabling developing countries to grow requires the use of climate-friendly technologies in these countries. In most cases, these technologies are first created in high-income countries. Thus, the challenge for climate policy is to encourage the transfer of these climate-friendly technologies to the developing world. This article reviews the economic literature on environmental technology transfer and discusses the implications of this literature for climate policy, focusing on the CDM.

A key point is that technology diffusion is gradual. Early adoption of policy by developed countries leads to the development of new technologies that make it easier for developing countries to reduce pollution as well. Since clean technologies are first developed in the world's leading economies, international trade and foreign investments provide access to these technologies. Moreover, evidence suggests that some technologies, such as those enhancing energy efficiency, will diffuse to developing countries even without the aid of policy prescriptions, such as the CDM.

The issue of technology transfer from industrialized to developing countries, a contentious issue in the ongoing climate change negotiations, should be seen as a win-win situation by both blocs. It can be resolved by developing innovative financial mechanisms, which reward the innovator without putting the financial burden on technology users. While developing countries have suggested measures like intellectual property rights (IPRs) related to clean technology to be treated as public goods or buying them down to get around the issue of financing estimated by UNFCCC to cost $200 billion by 2020, most business leaders of developing countries are in favour of market mechanisms supported by incentives for

managing technology transfer and deployment.

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REVIEW OF PRINCIPLES OF ECONOMIC DEVELOPMENT- WILL THIS BE ENOUGH TO REVERSE THE ENVIROMENTAL LOSS?

Natalia Vyniarchuk
Ukraine

Hardly anyone doubts the fact that the world of today undergoes dramatic changes - the further the faster. We keep losing health as well as filling our pockets. So why would the harm we cause outweigh the benefits we bring? Surely, the voice from the television screen will provide numerous theses just to calm us down and to reassure that things are not that bad. Unfortunately, most of us are opt to believe since it feels much safer to neglect problems rather than fight them. It is easier to destroy than to create and it is more difficult to think of the future of the humankind as a whole instead of yourself only.

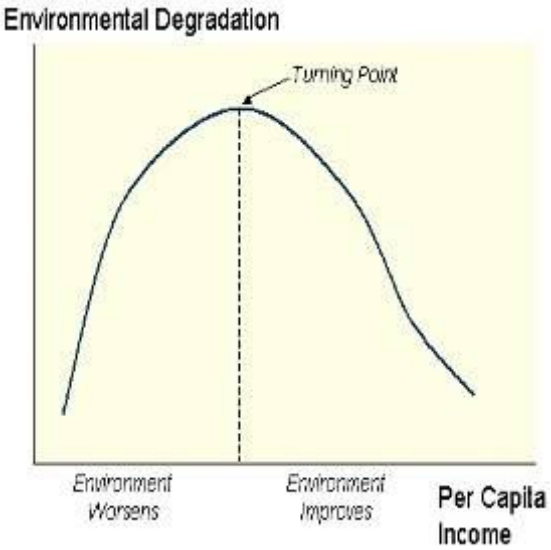
It can be hardly argued that due to unstoppable globalization trend the borders are becoming more relative, the cultural differences are slowly fading away, our goals and desires are getting more of a material and less of a moral kind, aren't they?

Economic integration and development of industry has shown itself so active in the causing destruction of our nature that everything that has been done as for conservation of endangered species, so for fixing somehow the harm which has been made, is completely insignificant in comparison - seems that our only weapon in the fight for healthy environment is prevention.

In fact, this should be the spur for realizing and dealing with the fact that we will have to spend much more money to restore than that we have earned while ruining. Although the question raised is mostly discussed from a theoretical point of view, only analysis of the ecology crisis related data is able to enlighten the way and clarify possible solution.

With the help of some statistical methods we would be able to discover factors which from the first sight have nothing to do with environmental issues, but in fact have a strong influence on the overall situation. As a result, the conclusions we draw will be more realistic and concrete.

Not to sound unfounded, I would like to present the environmental Kuznets curve. It illustrates how per capita income affects the level of environmental degradation.



On the other hand, as long as the main target of economics is to reach the top GDP rates, the problem of a closed circle is likely. The higher the GDP of a country the greater is the life expectancy, which as a result leads to the ever growing need for products and resources. The higher the demand is, the more recourses we are going to lack, for more alternative ways (including anti-ecofriendly) will we opt.

Another interesting fact is that according to the OECD investigations held in 65 there is "a significant negative relationship between the money countries extract from national resources and the knowledge and skills of their high school population".

All in all, we expect integration of sustainable development principles into state policies to force governments be more accurate in their prediction of adverse effects the further progress may possibly bring. At the same time we believe that ecology alone, deprived from economic research and analysis, is unlikely to cope with environmental problems on its own the same as international economics without environmental restriction and limitations will probably lead to complete devastation and destruction.

BALANCED SCORECARD AS AN ELEMENT OF FINANCIAL CONTROLLING SYSTEM

Alina Vysochyna
State Higher Educational Institution «Ukrainian Academy of Banking of the National bank of Ukraine», Sumy, Ukraine
Oleksiy Ryabenkov
Public Joint Stock Company «Sumy Frunze Machine-Building Science and Production Association», Ukraine

Intensification of globalization creates specific challenges for company's activity. The manager of modern enterprise has to solve the problem of development and implementation of the governance system sustainable to the impact of destructive internal and external business surrounding factors. It's very complicated process, because it needs the coordination of different company departments' efforts and integration of numerous methods and tools. So the necessity of the development unique and suitable management system determines the urgency of the topic.

Nowadays the problem of control, coordination, planning and methodological background insurance of company's activity under the holistic governance system is solved by the implementation of financial controlling and its methodology in company every-day operations. It's necessary to highlight that financial controlling is a system of methods and tools that ensures the concentration of the major control functions in key spheres of finance management with the aim of analyzing of company performance indicators, disclosure of fact and plan indicators inclination and finding out the reasons of this inclination to develop an effective managerial decisions on the base of researching results. Financial controlling system ensures the realization of the next tasks: coordination of information and departments' activity; development of the financial strategy and its coordination with company organizational structure; insurance of budgeting; internal audit organization; development of reports; finding out and restraining of negative impact realization; consulting. On the way of realizing of these tasks company can use different financial controlling tools such as SWOT analyze, portfolio analyze, benchmarking, break-even-analyze, ABC and XYZ analyze, shareholder-value analyze, Balanced Scorecard and others.

Special attention should be paid to the Balanced Scorecard (BCS), because this method coordinate different spheres of company activity and illustrate its performance in four perspectives: finance, customers, internal business processes and innovation and learning. BCS is the most widely applied performance management system today and through the use of different perspectives, it captures both leading and lagging performance measures, thereby providing a more balanced view of company performance. Moreover the BCS ensures the clarification of company's strategy, mission and vision to the hierarchically lower divisions and in this way it enables organization to align all levels of staff around a single strategy so that it can

be executed more successfully. Because there are often such situation when organizations script inspiring visions and compelling strategies, but than are often unable to use those crafted words to align employees action with the firm's strategic direction. So implementation of BSC could help to solve this problem.

It's also necessary to highlight that to be successful organization has to adopt the BCS to its external and internal circumstance. The main problem in this process is to choose the right measurement performance for designing an effective BSC framework. It has been found that a BSC framework using about 20-25 measures is the usual recommended best practice. But it's necessary to mention that the range of the measures is the object of scientific discussion of national economists.

We have analyzed numerous national researching and propose to accomplish such indicators for different perspectives:

– financial perspective: net profit, returns on investments, returns on assets , financial leverage, liquid indicators; such complex of indicators gives an opportunity to realize the comprehensive company financial situation assessment;

– customer perspective: market share, total sales, expenses of time for doing one order, product range wide and depth;

– internal business process perspective: equipment capacity, environmental impact of producing, level of equipment amortization and recovering,. Implementation into this perspective ecological indicators is very important because organization of company's activity on the base of corporate social responsibility concept permits to improve its competitiveness, raise the stakeholder's loyalty level and gain positive image;

– innovation and learning perspective: employee productivity, level of employee exemption, share of employees with defined qualification level, expenditures on personnel education, employee loyalty.

These key indicators are the base for creation of Strategic Maps that illustrate company goals in quantitative and qualitative evaluation divided by different perspectives.

So in conclusion we would like to mention that modern companies have to develop and implement new and effective methods of management to ensure a comprehensive protection from destructive impact of realization circumstance risks. Financial controlling is one of the most effective governance systems that help to control, coordinate and plan firm's operations. Among numerous financial controlling tools Balanced Scorecard is the most complex and efficient one. In fact, the benefits a company can obtain from BSC implementation includes: increasing the level of financial strategy transparency; aligning organization around a single, coherent strategy; making strategic improvement a continual process; mobilizing changes through strong, effective leadership. The BSC concept has been used for 20 years on developed markets and now there is the necessity of adopting it to the conditions of developing economies. Such adaptation could transform national business and economy and make it more stable.

FUNCTIONAL ZONING OF NATIONAL PARKS IN UKRAINE: PROBLEMS AND PERSPECTIVES

Lilia Yurkiv
Taras Shevchenko national university of Kyiv

For the last 20-30 years, a number of international decisions, resolutions, conventions, agreements, programs, state agencies and public organizations at the highest level have been devoted to environmental conditions and, especially biodiversity. Such attention to this problem at meetings of the highest levels is an evidence of its world importance. Today biodiversity actually determines the future of the international community because it provides a dynamic equilibrium of the biosphere, its sustainable functioning and determines the state of main spheres of human activity. If we solve the problem of environmental stability, we will get an acceptable environmental condition of the Earth and sustainable development, and hence the future of world civilization.

Despite the attention of all social levels, the state of biodiversity is continuing to deteriorate. Humanity increases the anthropogenic pressure on the biosphere and thus the corresponding environmental pressure on themselves, when we destroying nature, violates the global climate, ecosystem balance, destroying protective structure of the biosphere (ozone layer), changes the physical and chemical state of the atmosphere and hydrosphere.

Such ecological situation should induce to radical changes in environmental activities, but these changes should include not only increasing the number of protected areas, but, first of all, to provide quality of their functioning. Therefore one of the trends in optimization protected areas networks is the organization protected areas that have multifunctional purposes, where combined protection of natural biodiversity, recreational activities and environmental educational work and so on. In Ukraine these categories of protected areas are national parks, their functioning is one of the ways to sustainable development of any region, including urban system of Kyiv.

National parks have two purposes (unlike nature reserves and sanctuaries): protection-ecological function of national parks is to promote biodiversity of the environment, conservation vegetation fund, and the preservation of recreational resources through optimal use or support.

Evidence-based organization of national parks is very important, it provides for zoning and determine regime of land use areas in each zone, which will combine in rational way the massive visiting the territory with protection of natural systems. Accordingly, the functional zoning of the territory is one of the main events in the optimization of landscapes in protected objects.

In general, territorial and functional organization of national parks is their territorial planning, the core of which is to analyze the set of landscape, ecological, socio-economic factors and this procedure intended to provide an effective environmental management and sustainable development in the region. However, there

are a number of unresolved issues in this sector**:** first of all, significant problems occur when we develop specific zoning, they refer to combination of restoration biodiversity, protection of ecological integrity of the ecosystems and providing a basis for spiritual, scientific, educational, recreational and tourist services.

The main problems associated with polyfunctional zoning of national parks, are the following**:**

- there aren't standards to the selection of natural areas and their configurations, which provides creating the national parks**;**
- list of existing functional areas requires improvement**;**
- there is a need to develop regulatory and methodological database for functional zoning**;**
- there aren't scientific bases and practical recommendations for establish optimal area of the conservation area.

All of these disadvantages and problems that occur during the functional zoning are negative for the effectiveness of national parks. In Ukraine, functional zoning required by applicable law, but it has several disadvantages, because a need to improve the normative basis of this procedure and its practical application exists in our country.

The aim of the article is to identify deficiencies of functional zoning in national parks, to show the negative consequences of incorrectly separation zones in national parks, and systematization of general and methodological recommendations for functional zoning and providing suggestions for its optimization.

Information about landscape structure and bioecological characteristics of the region and European experience of territorial organization in NP, which are located in similar geographic and environmental conditions proposed to use for research of the optimization the spatial planning of national parks.

Theoretical basis of research is landscape-ecological approach (by M. Grodzinsky (1993)). Methodical basis of research are geographical (landscape) and bioecological approaches to planning of protected areas (Reimers, Shtylmark, 1978; Stojko, 1993, 1999; Brusak, 1997; Popovych, Shelyag-Sosonko, 2002; Andrienko, Onishchenko et al., 2001; Parchuk, 2004; Korzhyk, 2006) and geoecological planning principles for protected geotechnical systems (Kavalyauskas, 1985; Isakov, Voropaev, Grosser, 1987, Preobrazhenskyy, 1989).

Therefore, national parks have many common problems that caused the specifics of their operation (a combination of conservation, recreation, commercial use). Therefore, separation of different activities, conducting evidence-based zoning of the territory is a necessary condition their normal functioning.

Absence of zoning schemes or disregard of natural boundaries during the selection of zones is a major cause of disability in national parks. NP without professionally trained functional zoning will not be able to perform tasks that assigned to it. The wide field of activities within this topic is a prerequisite for subsequent research in this topic.

ADAPTATION OF METHODOLOGY CALCULATION RELATIVE CROWDING COEFFICIENT FOR EVALUATION COMPETITION OF TREE SPECIES IN POLYCULTURE

Oksana Zarochentseva
Yuriy Fedkovich Chernivtsi National University, Ukraine

Nowadays such indices as land equivalent ratio (LER), relative crowding coefficient (K), competitive ratio (CR), aggressivity (A), actual yield loss (AYL), and system productivity index (SPI) have been applied to describe competition and economic advantages in the intercropping. Our research is focused on the relative crowding coefficient, its adaptation to our results and attempt to resolve methodical controversial questions.

Relative crowding coefficient is a measure of the relative dominance of one species over the other in a polyculture (de Wit, 1960). Hall (1974) to assess the index of species comparative productivity for compatible species existence in community and named it as competitive power coefficient. Relative crowding coefficient is calculated as the following:

$$K_{ab} = \frac{Y_{ab} \cdot Z_{ba}}{(Y_{aa} - Y_{ab}) \cdot Z_{ab}} \quad (1) \quad \text{and} \quad K_{ba} = \frac{Y_{ba} \cdot Z_{ab}}{(Y_{bb} - Y_{ba}) \cdot Z_{ba}} \quad (2)$$

Where K_{ab} – the relative crowding coefficient for species ***a*** in polyculture with species ***b***;
K_{ba} – the relative crowding coefficient for species ***b*** in polyculture with species ***a***;
Y_{aa} – yield of species ***a*** in monoculture;
Y_{ab} – yield of species ***a*** in polyculture with species ***b***;
Y_{bb} – yield of species ***b*** in monoculture;
Y_{ba} – yield of species ***b*** in polyculture with species ***a***;
Z_{ab} – ratio (%) of species ***a*** to species ***b*** in polyculture;
Z_{ba} – ratio (%) of species ***b*** to species ***a*** in polyculture.

According to Willey (1979) both species has their own relative crowding coefficient within the intercropping system. Higher level of K_{ab} shows the predomination of species ***a*** over the other species with lower relative crowding coefficient. The product of K_{ab} and K_{ba} ($K=K_{ab} \cdot K_{ba}$) is interpreted as follows:

- if K is greater than 1, there is a yield advantage,
- if K is equals to 1, there is no yield advantage,
- if K is less than 1, there is a yield disadvantage.

Our research regards to influence of simulated acid rain and increased temperature on tree species of Bukovina in artificial models of ecosystems – microcosms. The question whether the multiple crops are more productive than single ones remains open and controversial. This problem is due to the fact that some species are growing better at the polyculture while other – at the monoculture. From the prospective of ecological crisis influence this situation can varied.

K_{ab} is highly applied to the grass species and it is used only with the positive sign in the current literature. This measure has not been applied previously to the tree species. Our application this measure to the tree species shows K_{ab} to be negative when productivity of species ***a*** within the multiple crops is higher than its productivity within the single crops. The negative value of K_{ab} indicates strong competitiveness of species ***a,*** while the positive value demonstrates its weak competitiveness in a polyculture. This means that sign of K_{ab} shows the strength of the studied species. Our results show the value of K_{ab} to be sensitive to the difference in species productivity within the monoculture and polyculture. Table 1 illustrates all possible varieties of K_{ab} values for both, ***a*** and ***b*** species.

Table 1 – Possible varieties of relative crowding coefficient values of species a and b in polyculture, and its explanation

Species *a*	**Species *b***	**Description**
$+K_{ab}$ $(K_{ab} > K_{ba})$	$+K_{ba}$	Both species exhibit weak inter-specific competitiveness, but species ***a*** is stronger than species ***b***
$-K_{ab}$ $(K_{ab} > K_{ba})$	$-K_{ba}$	Both species exhibit strong inter-specific competitiveness, but species ***b*** is stronger than species ***a***
$+K_{ab}$	$-K_{ba}$	Species ***a*** exhibit weak inter-specific competitiveness, species ***b*** is competitive strong in inter-specific interactions
$K_{ab}=0$	$K_{ba}=0$	Both species do not affect each other
$K_{ab}=0$	$+K_{ba}$	Species ***a*** does not affect species ***b***, within the last one exhibits weak inter-specific competitiveness
$K_{ab}=0$	$-K_{ba}$	Species ***a*** does not affect species ***b***, within the last one exhibits strong inter-specific competitiveness

Thereby, current methodology makes relative crowding coefficient to be a powerful tool for assessing of the competitive species interactions and for the estimation of economic advantages at the tree species polycultures.

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METHODS OF FORMATION SCENARIOS FOR SOLVING THE PROBLEMS OF SUSTAINABLE DEVELOPMENT OF REGIONS

Katerina Zaytseva
National Technic University of Ukraine "Kiev Polytechnic Institute"

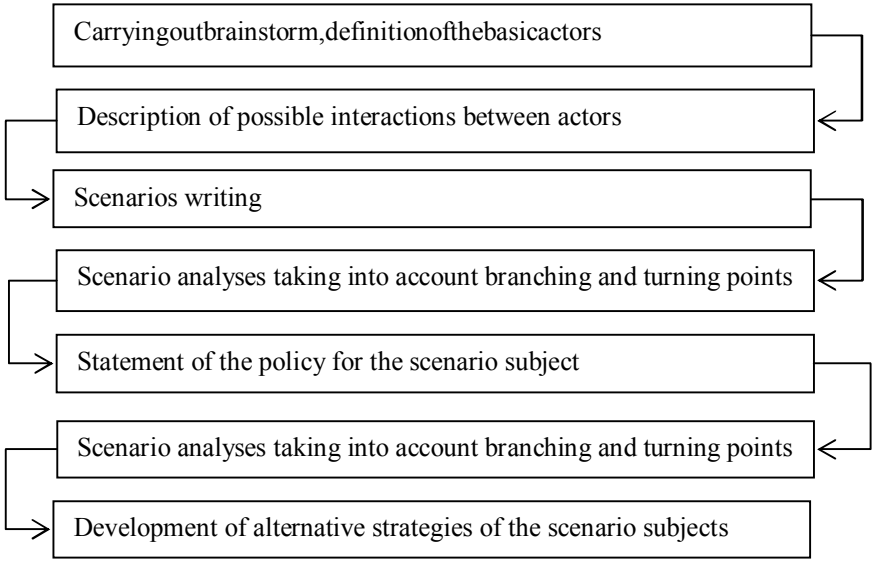
One means of to achieve sustainable social development is the efficient manage resources, both natural and information. Many authors are working on a system of environmental monitoring. There are systems of economic, environmental and social monitoring. To create a universal monitoring system, which will cover all of these factorsbecomes necessary.

One way to support the creation of the designer-to-user message is to help designersexpress what they want to say, before going into how the designer's deputy will say it.Scenarios can be used throughout the development process, starting from theanalysis of the domain and the users' tasks and characteristics. A major goal of usingscenarios at this stage is to explore or confirm, together with the users, the designers'understanding of the goals and tasks to be supported [1].

Foresee all possible scenarios in a single information system are virtually impossible. This is whyscenarios are designed.

The developer describes the actors, environmental factors and possible events. He also describes the sequence of interaction between the actors with the surrounding objects.

The sequence designs of systems, based on the scenario analysis, are discussed in the following diagram:



Thus, the scenario approach allows the user to foresee all possible situations and possible exceptions.Using a scenario approach to projecting the system makes it more user-friendly human-computer.

The human brain cannot handle a large number of complex operations, and for the adoption integrated solutions for sustainable development of society must be quick and effective decision-making at district, region or nationwide.

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