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Economics for Ecology

ISCS 2013

April 30 – May 3

Papers presented at 19th International Scientific Conference in Sumy

Under support of the joint project of European Union
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"Community Based Approach to Local Development"

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19th International Scientific Conference

"Economics for Ecology"
ISCS'2013

Економіка для екології

Матеріали
XIX Міжнародної наукової конференції

(Україна, Суми, 30 квітня – 3 травня 2013 року)

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"ECONOMICS FOR ECOLOGY" (ISCS'2013)

April 30 – May 3, 2013, Sumy, Ukraine

The conference organizers:	• Sumy State University, Faculty of Economics and Management • 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 19th International scientific conference "Economics for ecology" (ISCS 2013)

Tuesday, April 30	***Arrivals, Opening & Plenary session***
08:00 – 12:00	Registration of the participants
12:00 – 13:15	Official conference opening
13:15 - 14:20	Excursion around SSU
14:30 - 15:15	Lunch
15:30 – 17:30	Plenary session
17:45	Departure to the recreation center
18:30 – 19:00	Accommodation
19:00 – 19:45	Dinner
20:30 – 23:00	Ukrainian party
Wednesday, May 1	***Conference Working Day***
09:00 – 10:00	Breakfast
10:00	Departure to SSU
11:00 – 14:00	Workshops
14:00 – 14:45	Lunch
15:00 – 17:00	Debates
17:00 – 18:00	Conclusions, rewarding
18:15	Departure to the recreation center
19:00 – 19:45	Dinner
20:30 – 23:00	International party
Thursday. May 2	***Excursion Day***
09:00 – 09:45	Breakfast
09:00 – 18:00	Excursion (Sumy and Sumy region)
19:00 – 20:00	Dinner
20:30 – 23:00	Farewell party
Friday, May 3	***Departure***
09:00 – 09:45	Breakfast
10:00	Departure to Sumy

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THE CURRENT SITUATION IN KAZAKHSTAN

Kamila Alshinbayeva
Peoples Friendship University of Russia, Russia

Today the challenge of global climate change is one of the most urgent world problems, and it is important for all countries of the world community: for industrialized countries - because of the high level of energy use in all sectors of economy, and, consequently, of greenhouse gases emissions into the atmosphere; for countries with transitional economy that are, at first sight, not interested in activities on climate change prevention, but in reality they depend on them; for developing countries, which need to increase production volumes and which face the dilemma- whether they should participate in the global process of greenhouse gases reduction through establishment of their concentration control and introduction of effective technologies and less energy-consuming productions.

A very vulnerable environment characterizes the Republic of Kazakhstan: many types of landscape are presented in the country - from dry subtropics and deserts to mountainous glaciers. Many unique inland water reservoirs are located on the territory of the Republic of Kazakhstan - seas and lakes the Caspian, Aral, Balhash. Possessing unique stocks of natural resources (oil, gas, ferrous and non-ferrous metals, etc.), Kazakhstan in the times of the USSR was a raw materials appendix of the country, natural resources were often extracted without the regard of the negative impact upon environment and human health. The population of Kazakhstan really felt and continues to feel on themselves and on their health fatal consequences of environmental catastrophes, the reason of which is antropogenic activities. The development of virgin lands resulted in ploughing up of enormous territories of the country, intensive irrational development of irrigable farming in the basins of the rivers Amu Darya and Syr Darya - in the tragedy of the Aral Sea, rise of water level in the Caspian Sea - in flooding of the oil wells and oil-rigs and threat to lose biodiversity of the Caspian region. Significant territories of the country for the period of 1949 to 1991 were, and in some places still remain to be, under the pressing of the military industrial sector. Kazakhstan has suffered some the tests of nuclear weapons (Semipalatinsk and Azgyr), of military equipment and machines (Yemba, Sary-Shagan, Kapustin Yar), space tests are still carried out (Baikonur). Even today it is difficult to evaluate and calculate the damage caused on environment, agriculture, economy and human health of Kazakhstan by the irrational and cruel attitude to nature. These examples is only a small part of the ones that can be used to model and give the idea about the possible, even more serious consequences that will appear as a result of global climate change. By the increasing processes of the world integration, the problems facing the world community acquire more global character, solution of which supposes the common co-operation of the countries.

Depending on the importance of global climate change consequences and on the world priorities of the problem, Kazakhstan thinks it necessary to continue the process of ratifying the Kyoto Protocol and obtaining the status of Annex 1 country, that will serve as a legal basis for participation in all the mechanisms of the Kyoto Protocol and attraction of external funds and new technologies.

At present Kazakhstan plans to continue works in the direction, with support of the world community, all the more, Kazakhstan does not rely only on external support, but also carries out serious researches. The country studied and continues studying vulnerability of economy and natural resources to climate change, and assessing possible activities to adopt to expected climate changes.

THE ECONOMIC ROLE OF GHANAIAN CULTURE AND ITS TRADITIONS IN NATURE PRESEVATION & ENVIRONMENTAL SUSTAINABILITY

Ankamah Pius
Sumy State University, Ukraine

Decent life depends on nature's provision of stable resources. In this report I want to explore how Ghanaian cultural efforts embedded within nature preservation and environmental sustainability. Ecology and by ecology I understand the study of the reciprocal relations of all forms of life, one with the other, and with their environments is not for the scientific agriculturalist alone; its light must guide the path of the farmer ,administrator, and the statesman. Ghana like many other African countries is endowed with very rich beautiful culture and tradition. The traditional culture of Ghana stressed a strong relationship with the environment, and in the past, a culturally acceptable environmental management resulted from strictures and taboos related to water bodies, land, and deep forest. Though there are some cultural practices that are peculiar to some towns and villages, in general they have so many things in common and served the same important purpose of nature conserving preservation and environmental sustainability. This, to a large extent helped saved the environment and our ancestors rarely died of pollution related ailments. With the advent of Christianity, Islam, civilization and its accompanying technology in Ghana, however, many of these beliefs, taboos, customs and traditions have been relegated to the background and are regarded by many people, though they played a vibrant role in nature preservation and environmental sustainability.

Among the Akan community which forms the majority ethnic group in Ghana, water bodies are associated with the gods and are used in accordance with rules that are relayed to the local folks by fetish priests who are the mouthpiece of the gods. Customary laws mandate users to keep lakes and rivers pure because they

are regard as the dwelling place of the gods (abosom). The abosom were highly revered and feared in the past and even they are still accorded that respect by some Ghanaians. It is believed that, these gods are highly endowed with divine powers and will strike defaulters dead instantly with no mercy or give a second chance. People feared the gods and hence adhered strictly to these directives and preserved the water bodies better than what pertains in contemporary Ghana. Apart from the general regulations, In These customary regulations worked very well in the olden days and are still common in the countryside. However, it tends to break down where population mobility has led to coexistence of groups with varying customs. In order to mitigate these drawbacks, there is the need for us as a country to device more pragmatic policies that will integrate our traditions and customs that promotes environmental sustainability with that of modern Ghanaian beliefs to achieve the ultimate goal.

In the past, the deep forests were also regarded as a place of abode of the gods and the dead ancestors. Such places were highly revered and worshiped. Farming, hunting, felling of trees for fire wood and many other activities were forbidden in those forests. It was a taboo for anyone to fell trees or farm in such restricted forests. This indisputably helped preserved the forest vegetation and biodiversity which our current generation is destroying now. Our forefathers were very conscious and protected our natural resources in what one may described as unscientific, but in effect, we inherited rich forest which was stocked with great medicinal sources and precious minerals. If our ancestors who did not know anything about schooling and technology were able to conserve the environment in such a laudable fashion, what are we doing as contemporary generation with formal education and technological advancement? I believe the time to combine technology and tradition to save our perishing natural resources is now.

Among almost all the tribes along the coast of Ghana, it is forbidden to go fishing on Tuesday. Tribes that are located in the forest zones of Ghana forbid hunting and farming in the forest at some days and some periods of the year. It is also a taboo for a hunter to kill an animal and refuse to eat. It is even a worse offence for a farmer or hunter to kill game that is young, pregnant or fending for their young ones. It is believed that earth mother will strike defaulter instantly to death. It was also believed that such a person might also not have children or loose or his children if he kills a pregnant or young game. I believe that there is the need to revisit the past and integrate good part of our traditions and customs with modern ones and to safeguard Ghana's natural recourses and promote environmental sustainability. There is an African proverb that says that 'a man who does not know where he is coming from does not know where he is going to''. This nature preservation such forest, water bodies in Ghana serve as tourism, which is growing economic activity in Ghana and has contributed greatly to the potential development of the country. These natural scenes' which was preserved through our cultural heritage generate employment opportunities for the local people in

their own communities and in the long run reduce unemployment rate in that particular geographical location where these natural environment is located. These natural scenes which have preserved by Ghanaian culture contribute 6.7% to the national Gross Domestic Product the country earns. For instance eco-tourism and recreation. I will recommend to international organizations to reorient its attitude on roles of cultural leaders and institutions, conceiving them as partners in development because their contribution will only be meaningful if they are fully empowered in actions leading to sustainable development, such as environment conservation and climate change mitigation.

Conclusion. Development which is not grounded in past values becomes irrelevant for the present generations. Once this is manifested, it baffles future direction and sustainability. Thus, development policies, such as those on environment and nature preservation in Ghana, as well as elsewhere, must strive to consolidate what was good in the past to mutually interact with present ideals, if the future is to remain meaningful.

GREENING ECONOMY, GREENING PEOPLE

Tamari Bandzeladze
Ministry of Finance of Georgia

"Green Economics is the green movement's challenge to main stream orthodoxy in economics and it is gaining ground globally and in the corridors of power as the best alternative to solving climate change, the credit crunch, poverty and biodiversity losses. It is about providing reclaiming the practices and policies of economics, for all people everywhere, nature, other species, the planet and its systems. It is about provisioning for the needs, impacts, effects and responsibilities, for everyone and everything on the planet".

Miriam Kennet, an economist and Green Economics Institute Founder

Green economy is one that generates increasing prosperity while maintaining the natural systems that sustain us. The greening of economies is not generally a drag on growth but rather a new engine of growth; that it is a net generator of decent jobs, and that it is also a vital strategy for the elimination of persistent poverty.

Historically, of course, the trend has not been towards green growth. On the contrary, economic expansion has imposed ever greater demands on natural systems — both in terms of the amount of resources that we extract or harvest, and the volume of emissions and waste that we expect the environment to absorb and neutralize.

As is increasingly understood, this cannot continue indefinitely: the environment has natural limits in terms of how much it can provide and absorb.

people for their comfort are growing cities, building factories, issue cars, throw away litter, cut down trees, contaminating water, using aerosol and they forgive, that growing cities cause the countryside to disappear. Factories and cars release poisonous chemicals into the air, the chemicals mix with the water in the clouds, and the polluted rain which later falls damages trees, lakes and buildings. Producing too much packaging and food waste which are dropped in the streets or end up on the rubbish tip helps diseases spread more easily. Because of deforestation less and less oxygen is being produced. Factories produce dangerous chemicals, which pour into oceans, rivers and streams and cause the death of fish. Chemicals from aerosol sprays and fridges are going up into the atmosphere and destroy ozone layer, which surround the Earth, because it more and more people are getting skin cancer.

So we people are damaging Earth whereas it needs more and more care. We should not think only about our comfort we should think about future. There are several ways to help improve the situation. Firstly, Don't allow your children to free those colorful balloons in mid air. Teach your children not to release these balloons. For balloons that escaped the grasps of your children that will get into oceans and seas will be mistaken as yummy jellyfish by sea turtles. Sea turtles takes a lot of years to mature and unfortunately some of them got killed by eating balloon or plastic bags. Sea turtles are part of the delicate cycle and if their population is affected other species of marine creatures are also under threat. Secondly, we should encourage recycling because it is the reproduction of new materials which causes the most damage. We must learn to reuse things like plastic bags and glass jars. So collect old newspapers, books, magazines, used papers, bottles (plastic and glass), and any other things that you could sell in junkyards. There is money in garbage and at the same time we're doing our part in recycling process. Thirdly, using bicycles instead of cars or driving an environmentally-friendly car is also helpful. Furthermore encourage industries to use cleaner methods of production. Moreover, we must deny using a lot of aerosol. Also be kind to trees. As much as possible use forests products and timber very well with optimum efficiency. You may use the back of coupons, use pencils until it become as small as possible, and don't play with matches. Try to get involved in tree planting in your local conservation program. This could be fun as trees can give us added oxygen, shades for people and a refuge to different insects and birds. Moreover, you can join an organization, which plants trees or cleans up beaches, would be provable that you are really concerned about the environment. Lastly, supporting groups such as Greenpeace, which try to prevent many environmental disasters, would help to ensure that our planet will be clean and safe for future generations.

Green economy is an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. The United Nations system views greening the economy as a tool to help achieve sustainable development and eradicate poverty. In this context, green economy is seen to be at the heart of renewed efforts to integrate environmental and social considerations..

We must realize, that we are part of the nature and we should “make green” in numerous spheres, implement technologies and not to conquer the nature to improve our life, but remain as its part, create boon and retain our existing sphere. If we suggest our children, government, friends and each citizen to treat the nature carefully, we certainly will have a good result.

RESOURCE-SAVING TECHNOLOGIES

Stanislav Baraban
Tavria State Agrotechnology University, Melitipol, Ukraine

All that is routinely used by mankind, from electric lighting to flat-screen TV sets and iPhone - depends on our ability to pump out of the Earth's resources. Modern life of humanity is depend on the expense of natural resources.

Most scientists believe that present levels of consumption and amounts of proved resources are enough to mankind that to recoverable oil reserves for the nearest 50-80 yearsand the deposits of gas - for 60-80 years. The world rushes into «the crisis of the depletion of natural resources». At the moment the new technologies have they are used already invented and used for the extraction of power!

Wind generators, solar batteries, microhedroelectric stations became the sourse of the alternative energy! Ukraine started to move to a new level of energy supply. So about 4 million hr. was invested in the projects of wind power plants in berdyansk and village botiyevo in 2013. Wind turbine can work autonomously without network.

They can be small and medium-size with power from 0.5 to 30kW. Wind generator can work both individually and as a part of the so-called «hybrid installation», in combination with the diesel-generator, solar panels, etc. The most effective installation is solar batteries. In the southern regions of Ukraine they are installing now. Solar photovoltaics can be of the following basic types: self-contained - in case if there is no connection to the network. Solar modules generate the electricity for the purposes of the light, the power of television, radio, pump, refrigerator or manual tools. Usually, for the storage of energy the rechargeable batteries are used. One of the most effective directions for the development of

alternative energy is the use of energy of small watercourses pumps which are operated with the help of small hydroelectric power plants (micro-hydro).

Nowadays, the different types on instalationsare maintained in the world:

1)The world's largest solar power station in Thailand;

2)The largest solar farm in Australia;

3)The first solar plant in the Sahara;

4)Hydro power station the "Three gorges" in China.

Gradually the "new"power plants should replace the "old" ones that to improve economic environmental, autput sides of industrial power. The ultimate goal is the creation of a hybrid system of managment with other mechanisms of energy production and consumption.

The development of the energy sector in the world and the state policy in this field, includs the energy strategy of Europe for the period up to 2030. Drafted in the spirit of the industrialenergy and is aimed at building up the production of the energy facilities.

ASSESSMENT PROFILE OF WASTE MANAGEMENT SYSTEM IN UKRAINE

Oleksandra Bilopilska, Sergiy Frolov
Sumy State University, Sumy, Ukraine

With the industrialisation waste emerged in the proper sense. Waste had to become a problem so that waste management could develop. Within industry, commerce as well as households non-renewable resources were used with increasing intensity. Furthermore the economic development of the industrial system took up pace. Products got replaced faster and more frequent and were devaluated to waste. Through the development of new technologies and energies, the large scale use of raw materials that have been rarely used yet as well as the development of new markets a self-reinforcing process came into being. All these factors lead to an increasing economic and social change as well as a so far unknown amount of waste.

The aim of the classification into several stages is to prove that waste management is nothing else but an ongoing innovation process that is driven by a changing environmental awareness of the population on the one hand side and technological steps on the other hand side. Therefore the stage model represents the transition of waste management from the pure disposal management over a more or less controlled waste management to a resource efficient material flow management and consists of 6 stage: “Coverage & Disordered Disposal”, “Ordered landfilling”, “Collection logistics”, “Recycling solutions”, “Industrial Cycle”, “Raw material sourcing”.

The model has been constructed according to the development of various waste management systems. A first validation took place in the form of consecutive case studies analysing the waste management system of different countries. As the model turned out to describe the current situation of waste management in any European country very well, companies and institutions working in the field of waste management can use it as a starting point for further analysis. The model can serve as a means of evaluation and decision tool and therefore as an instrument for deriving a strategic basis for companies wanting to expand their business into the new member states of the European Union or other countries in Southeast Europe.

Based on analysis of 12 indicators we built assessment profile of Ukrainian's waste management (figure 1). An assessment profile allows representing the waste management situation of our country in a graphical form. The vertical list shows the various above introduced indicators. The stages of waste management are listed in the columns.

	Indicators	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Economy	GDP	●					■
	Inflation rate		●				■
	Industrialisation		●				■
Society	HDI		●			■	
	Unemployment rate			●		■	
	"Green" movements		●			■	
Policy	Data collection		●				■
	Separate collection		●				■
	Reporting duties		●				■
Ecology	Landfilling	●				■	
	Recovery/Recycling	●				■	
	Contaminates sites	●				■	

Figure 1. Assessment profiles (● Ukraine, ■ Austria), (author's own work)

A point in the specific column and row marks the current development stage in that field. As the development of waste management even within the stages takes time, the point can stand at the beginning, middle or end of each stage.

The development of a country's waste management system illustrates a sequence of comprehensive innovation projects that apply for appropriate requirements. For those countries that are still in the early stages of waste management, the phenomenon occurred that the ecological field is less well developed than the other areas.

In Ukraine plans and concept of solid waste management were adopted, which includes impossible task and the main reason for their implementation impossibility is the low environmental awareness of the population. Research shows that the majority of European countries implemented a strategy of solid waste management quite successful, and now in some countries is forbidden to place on the landfills the solid waste that have not been processed. New strategies that aim to use alternative energy resources, regarded as an alternative as well the municipal solid waste. It is significant to determine the stage of development what can be attributed to the state of waste management system in Ukraine and define the factors that influence on the system's development. This will help to develop realistic plans that include tactical and strategic tasks that correspond to the economic, social, legal and environmental level of development of the country.

DECOUPLING EFFECT AS A PART OF THE ECO-FRIENDLY DEVELOPMENT OF KYIV CITY

Volodymyr Boiko
«Institute of economics of natural resources using and sustainable development of National Academy of Sciences of Ukraine»

Global economic city growth is accompanied by unbalanced exploitation of the environment, which increases a risk of dangerous environmental situations not only for the city, but also for the surrounding area. For countries, oriented towards sustainable economic growth, environmental conservation is a main purpose, since the achievement of eco-friendly development is identical to the increase of life quality by the decrease of environmental pressures. Therefore, the question on the difference between the economic growth and the decrease of pressure on the environment that was called "decoupling" has recently got particular attention. "Decoupling" represents the ability of the country economy to the economic power growth that is not accompanied by increased pressure on the environment.

The value of decoupling effect is calculated as an indicator of division as follows:

$$F = 1 - \left(\frac{EPe}{EPb} : \frac{DFe}{DFb} \right)$$

where DF - an indicator of economic growth, which is taken through macroeconomic indicators, EP – an impact on the environment which is an environmental hazard, *e* - this year, *b* - base year.

Since there are many indicators of environmental burden, it is reasonable to single out the main ones for corresponding calculations. Taking into account the indicators directly connected with manufacturing and consuming, one should determine such indicators as the amount of discharge of polluted substances into air, the amount of discharge of sewage and the amount of waste products of the 1-3 danger classes.

The compiled information on the parameters and the corresponding results can be grouped in the table shown below (Table 1). The graph of the decoupling-index dynamics is shown in Fig.1.

The analysis of the results of the decoupling-index has shown the growth of the economic component and to some extent, reduce of the burden on the environment. However, the graph curve shows that a well-established tendency is too soon to speak about, especially in 2010.

It should be noted that the main role in constructing the curve of the decoupling-index plays statistics, and it is important for them to be comparable and for methods for collecting and processing statistical information to be unchanged.

Table 1 – Compiled information on the parameters

Year	2005	2006	2007	2008	2009	2010	2011
GRP, m UAH	77124	95267	135900	169564	169537	196639	205094
Emissions of harmful substances in the air, total, thousand tons	220,5	227,1	230,5	275,2	277,9	265,3	254,5
Drained return water, m m^3	899,7	817,3	723,1	715,0	657,5	649,5	614,5
Formed hazardous waste, thousand tons	7369,3	8933,7	13451,1	10880,9	5358,7	14016,9	11208,5
Decoupling-index according to emissions of harmful substances in the air	-	0,17	0,29	0,04	-0,01	0,18	0,08
Decoupling-index according to drained return water	-	0,26	0,38	0,21	0,08	0,15	0,09
Decoupling-index according to formed hazardous waste	-	0,02	-0,06	0,35	0,51	-1,26	0,23
Integral decoupling-index	-	0,15	0,20	0,20	0,19	-0,31	0,14

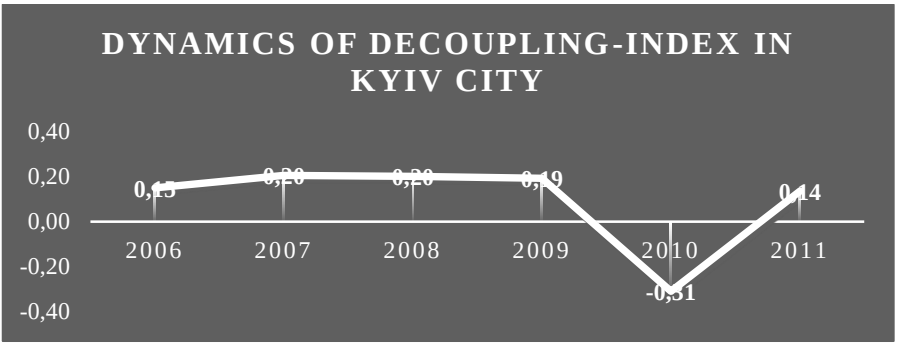

Figure 1. Dynamic of decoupling-index in Kyiv city from 2006 to 2011 years

SYSTEMIC APPROACH TO THE WASTE-FREE PRODUCTION

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The issue of the environment has become central, which is where it belongs, in the vicissitudes of human life. It certainly was not discovered yesterday, but the pressure of humans on natural resources in the last half-century has become more intensive and widespread than ever.

In the past 50 years humans have changed ecosystems more rapidly and extensively than in any other comparable period of human history, mainly to meet the growing demand for food, water, timber, fiber and fuel.

Water, air and earth, indispensable resources for human survival come, until recently seemed to have no value and were exploited in the belief of unlimited availability.

These three elements, in classic economic theory, were considered resources available to humanity at no cost. However, the accumulation of environmental problems has challenged this theory: the bad smell of air and rivers, urban smog and the excessive growth of algae have demonstrated that clean air and water must be valued. Currently these resources cannot be considered free for the taking.

Alternative production methods are possible when the proper value is given to materials which are currently viewed as merely scraps of production rather than resources that can be made available for other types of processing. We need to retrieve the cultural and practical capability to delineate and program the flow of material from one system to another in a continuous metabolization that reduces ecological impact and generates a notable economic flow; currently the scraps of production processes are only an economic and environmental cost. To understand

the complexity of a system made up of relations between different beings and the continuous evolving flow of matter, it's essential to turn to Nature. In Nature there is no such thing as waste and even surpluses are metabolized by the system itself.

If these conditions, which are fundamental for a living system, are adopted in production, they will favor the development of a zero-emissions production precisely because the waste (output) of one process is used as a resource (input) for another production process. This leads us to a change in perspective that goes in the direction of thinking by connections. Therefore the production process will no longer be seen as a sequence of actions independent of each other but will be considered in its entirety.

The above mentioned concept is the first of five principles of Systemic Design, which are:

1. The output of a system becomes the input for another one.
2. Self-producing systems sustain themselves by reproducing automatically, thus allowing them to define their own paths of actions, and jointly co-evolve.
3. The local context is fundamental, because it values local resources (e.g. human, culture, materials) and helps resolve local problem by creating new opportunities.
4. The systemic approach is based on relationships: each one contributes to the system and the relationships can be within the system or outside of it.
5. Man connected to own environmental, social, cultural and ethical context.

Until today people always thought of the production process as a sequence of actions independent of each other for the purpose of producing goods. However, unfortunately, this model creates a substantial amount of waste.

Society currently uses a linear approach to handle situations, analyzes cause-event phenomena and solves technical problems. Its studies spot strategies…but this is not innovative. We need to make an effort to change our usual way of looking at problems and confront them from different angles. In an ever more complex world like ours, it becomes necessary to give up the exclusive focus on the product and the product lifecycle and extend our gaze, and therefore our competence, to the entirety of relationships generated by the production process.

We must start with the realization that organic waste thrown away and not valued contains large quantities of precious resources for other manufacturing processes. Systemic methodology leads industries to organize themselves into local sustainable groups in such a way that the waste products of one can be sold as a resource to another and benefit both of them.

Precisely like a local ecosystem where the representatives of the various species live in close contact, interacting according to complex dynamics, in the proposed productive system, which embraces the systemic concept, new connections link different production enterprises, new flows of material are generated and the energy and resources are put in circulation thanks to a multifaceted web of interdependencies.

The greatest innovation offered by this approach consists of raising the awareness of producers that the problem of waste can be solved by activating complex relations in which the outputs of one productive process connect the nodes, which are local companies, of a network in which know-how, well-being, material and energy transit.

When the outputs are considered raw materials filled with potential, it allows the so-called scraps to become materials worthy of proper, rational and targeted management for being reused as raw materials for other production processes. The systemic approach produced higher economic profits and better quality products abounding in vital social and ethical values because attentive to human and animal health as well as respect for the environment.

Today it is precisely environmental degradation, the lack of resources and the myth of unlimited development that have forced us to think about and reconsider the role of humans in society. We do not play the role of director but rather we are part of an interconnected and interdependent system. Being aware of this means thinking and acting to create a sustainable future in which we can meet the needs of everyone without jeopardizing the needs of generations to come, not only in terms of material resources but also in terms of cultural diversity and growth. This requires a radical change in our perception of reality, starting with a redefinition of the basic values shared by society.

WORK FORCE COMPETENCIES AS THE FIRM'S SUSTAINABLE DEVELOPMENT FACTOR

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Firm's sustainable development is the process of continuous changes where use of resources, sci-tech development, implementation of innovations, and improvement of personnel's work are coordinated with each other and aim at raising the firm's current and future potential, its need satisfaction, and reaching strategic goals.

New economic and environmental conditions stipulated, as being the prior ones, the tasks of the firm's sustainable development and the firm's capability to withstand unfavourable situations which dictates the necessity of ensuring reliability of each separate firm. Practice shows that existing today problems cannot be solved without creating a mechanism which would ensure the firm's sustainable development.

Firm management mechanism can be implemented only within a management system framework, which ensures solving the firm's problems that arise. Management in the sphere of sustainable development implies capability to

discover various factors influencing the level of the firm's stability while using their influence as required for the firm.

Stability of the firm is such a condition of material, physical, and cost structure of production and sales of the products, which ensures sustainable high result of the firm's activity.

Stability of the environment is assessed, first of all, in the context of its stability and known impact of the factors that define its basic characteristics of condition. External stability of the firm is determined most of all by stability of economic environment within which the firm's activity is conducted. It is achieved by corresponding mechanisms for managing the economy on national scale/ Internal stability of the environment is stability of internal environment of the firm.

Sustainable development of the firm is such a production and sales dynamics, which not only maintains sustainable high result of the firm's activity, but keeps this result growing.

The firm's sustainable development can be viewed as a sort of compensatory mechanism allowing the firm not just to adapt itself to destabilizing influence of internal and external environment, but to grow continuously. The higher the sustainability of the firm's development, the lower the risk of possible deviation from expected result, and vice versa.

Analysis of possibility of the firm's sustainable development in modern conditions calls for structuring of arising problems. From our point of view, financial and administrative types of sustainability have a significant impact on the firm's sustainable development.

The problem of defining a limit for each sustainability type plays a special role in complex problem of the firm's sustainable development assessment.

Sustainability of the firm's financial activity is the most important characteristic of its performance, describes the result of its current, investment, and financial development, reflects the firm's capability to serve its debts and liabilities. Financial sustainability means such a condition of the firm's financial resources which allows the firm to achieve the established goals by free monetary manoeuvring.

Administrative system is dynamic, has capability to develop, can make transition from one quality condition to another remaining to be a system. In the process of development, the elements of administrative system gradually loose capability to perform the functions assigned to them which leads to disruption of the system's structure. As a result, the task of keeping structural identity of the firm management system, i.e. maintaining the conformity between the components it contains and purposes of activity, arises. The system's structural conformity is not set automatically but is achieved through organisation.

The structure of the functioning firm management system continuously resists changes of the system's elements. Therefore the firm management system's development can lag behind the requirements of the environment. System's

capability to maintain the balance between the system elements' changes and the management structure is exactly what determines the administrative sustainability of the firm.

Efficient management of the firm's development can be achieved on one hand by highly professional work of the firm's managers, and, on the other hand, by adequate stimulation of its personnel.

Today, many industrial firms in Russia, as a result of economic crisis, have already completed or still continue to undergo changes of property form, number, and composition of the structural divisions, i.e. so called restructuring takes place. All this, as a rule, leads to changed economic strategy and social policy. At the same time, higher work efficiency and quality on the scale of the whole firm often depends not so much on industrial equipment as on the human factor.

Success of any reform at the firm, including the personnel management sphere, depends on the level of preparedness and involvement of all members of collective into the process of transformation. An employee must be considered not only as a worker, but also as a personality. His/her personal interests must always be interleaved with the firm's goals. To this end the management must possess information on the motives that drive any worker in the work activity, and routinely assess the results of any such activity.

Each firm must look for its own way to manage the personnel. Particular approach depends on the situation, but general corporate policy must imply interaction of innovative, financial, and technological strategies in parallel with the strategy of improving personnel management and development.

Solving of mentioned above problems calls requires detailed analysis of existing in the firm techniques and methods for personnel management, selection of optimal administrative solutions, and professionalism of the management team who must be an initiator and conductor of the sustainable development concept.

MECHANISMS OF ACHIEVING SUSTAINABLE DEVELOPMENT IN DEVELOPED COUNTRIES

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As early as forty years ago, developed countries became concerned with the concept of sustainable development and then quite successfully turned it into applied policy issues. The conceptualization of sustainable development implies integration of three pillars: (i) economic development; (ii) social development; and (iii) environmental protection. Progress across all three provinces in a consolidated manner is considered as a critical step towards the achievement of sustainable development [1].

Starting from the Human Environment Conference, held in 1979, developed countries have been searching for appropriate mechanisms of achieving sustainable development. The best known international conferences that had influenced tremendously the policy of sustainable development had been the Rio Earth Summit (The UN Conference on Environment and Development) of June 1992.

The World Summit on Sustainable Development (also known as Rio +10) was held in September 2002 in Johannesburg, South Africa. New targets were established. United States Secretary Colin Powell called the Summit a "successful effort", saying that "it shows that we have a shared vision of how to move forward". In his view, the world was seen as committed to sustainable development. However, it was assumed that the real challenge "is not just what is said in the statement, but the actions that will take place in the months and years ahead" [2].

The UN Conference on Sustainable Development, which is better known as Rio +20 or Earth Summit 2012, took place in Brazil in June 2012. As it had been demonstrated, sustainable development remains a fundamental objective for developed countries.

Besides numerous documents adopted by world community, many developed countries elaborated mechanism of their own for sustainable development, as it could be illustrated on the example of Norway. For many years Norway follows the principle "think globally, act locally", being able to demonstrate on its own example how to use rich natural resources for the benefit of the population. On the other hand, there are many examples when depletion of non-renewable resources is well above investments in the other sectors of economy, which reduces the national stock of capital in its broadest sense. As a result, the development path taken is clearly unsustainable. Being inspired by not just a few examples of the opposite flavor, Norway launched its Oil for Development initiative in Autumn 2005 to assist developing countries in managing their crude oil resources [3]. Among several mechanisms of achieving sustainable development, Norway emphasizes economic instruments that contribute to cost-effective solutions while implemented properly. For example, companies and households tend to reduce their use of commodities and products on which environmental taxes are imposed because it is just in their own financial interest. [3].

Considering mechanisms of achieving sustainable development it could not be mentioned Sweden. First of all, Swedish approach to sustainable development takes into account such a basic principle: all policy decisions must respond to the longer-term economic, social and environmental implications, meaning that every decision taken by Swedish politicians should be appropriate in this respect [4]. Swedish government had achieved 17 agreements with the enterprise sector on this field. Sweden established special dialogue projects "Bygga Bo" (in English "Building/Living") and "Framtida Handel" [5]. The former is a dialogue between

20 companies, three municipalities and the Environmental Advisory Council where a future sustainable building and property sector used to be discussed.

In the Northern Europe, the housing and service sectors account for more than 40 percent of total energy consumption. One way to reduce consumption is to build low-energy residence areas, passive houses heated mainly by the energy already produced there, such as body heat, electrical appliances, lighting and sunlight. Passive houses have been built in a number of communities across Sweden, including Stockholm, Göteborg, Västerås and Helsingborg. Seven out of 10 Swedes want to live in an eco-labeled house and would consider paying more for it [6].

Despite the institutional framework that is very effective one, developed countries try to bring up a high conscious of it's citizens through the educational programs, mass media activities, and what is the most important - millions of people can take part in developing this kind of policy and many new research institutes are opened every year. Such multi-dimensional activities look sustained in the long run, because new and new ideas of sustainability are brought up day in day out.

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ENSURING ECO-EFFICIENCY FOR SUSTAINABLE DEVELOPMENT

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The term eco-efficiency was coined by the World Business Council for Sustainable Development (WBCSD) in its 1992 publication "Changing Course". It is based on the concept of creating more goods and services while using fewer resources.

Strategies that have been linked to eco-efficiency include “Factor 4” and “Factor 10”, which call for specific reductions in resource use, “natural capitalism”, which incorporates eco-efficiency as part of a broader strategy, and the “cradle-to-cradle” movement, which claims to go beyond eco-efficiency in abolishing the very idea of waste. All versions of eco-efficiency share four key characteristics:

Confidence in technological innovation as the main solution to unsustainability.

Reliance on business as the principal actor of transformation. The emphasis is on firms designing new products, shifting to new production processes, and investing in R&D, etc., more than on the retailer or the consumer, let alone the citizen.

Trust in markets (if they are functioning well).

“Growthphilia”: there is nothing wrong with growth as such. Moreover, with “cradle-to-cradle”, growth is conducive to sustainability per se.

The emphasis is on firms designing new products, shifting to new production processes, and investing in R&D, etc., more than on the retailer or the consumer, let alone the citizen. Trust in markets (if they are functioning well). “Growthphilia”: there is nothing wrong with growth as such. Moreover, with “cradle-to-cradle”, growth is conducive to sustainability per se.

To be sustainable organizations must embrace new objectives: optimize operations to minimize environmental impact and improve social outcomes in a manner that also maximizes performance.

No matter what your business is, sustainability is your business. For example, by 2025 buildings will use more energy than any other category of “consumers” (today, in the United States they represent 72% of energy use). In addition, 40% of the world's current output of raw materials goes into buildings. That is about 3 billion tons annually.

Benefits of eco-efficiency refer to increase in economic value with unchanged (or decreased) environmental impact. As indicated in Table 1, four variants of increased eco-efficiency indicators can be defined:

an increase in eco-productivity, i.e., efficiency of environmental impact. *A decrease of nature intensity*, i.e. a decrease of costs of natural factors;

an increase in the efficiency of environmental costs, i.e. better state of the environment per unit of environmental cost;

a decrease in environmental specific costs, i.e. costs per unit of environmental state improvement.

Table. 1 – Four types of eco-efficiency

Ratio	Goal	
	Productivity increase	Environmental state improvement
Economic versus environmental indicators	Total production per unit of aggregate environmental impact costs or *environmental productivity*	Sum of costs incurred per unit of environmental state improvement indicator (averted damage)or costs of environmental state improvement
Environmental versus economic indicators	Environmental impact indicators (ecological-economic damage) per unit of production or *environmental intensity*	Improvement of environmental state per unit of costs or *environmental cost-effectiveness*

Increase in efficiency is one of the key success components in business. Enterprises constantly seek ways to improve their efficiency.

Eco-efficiency (EE) refers to the idea to produce more goods and services using less resources. EE is defined as:

$$EE = P_e / B_{n,} \quad (1$$

where P_e is the economic result (the additional value of produced net goods, additional profit etc.); B_n - an estimation of the environmental impact (in particular, the amount of consumed natural goods and their monetary value, economic environmental damage).

The basis for evaluating eco-efficiency is the integral material intensity indicator *(M_u)*

$$M_u = \sum M_i / \sum S_i \quad (2)$$

where $\sum M_i$ is the input of material costs (natural raw materials) in the production process or production chain; and $\sum S_i$ is the quantity of services provided (produced goods). The inverse ratio $\sum S_i / \sum M_i$ is the conditional equation for *natural-resource efficiency* or *eco-efficiency.*

The integral material intensity analysis (or M_u – analysis) allows identifying more effectiveness of goods; in other words *dematerialization* of the economy. This allows addressing environmentally dangerous *outputs* (emissions, discharges, wastes etc. at the end of production process or consumption) in relation to the flow *inputs*.

ECONOMIC AND ENVIRONMENTAL IMPACTS OF MINING ACTIVITIES IN GHANA

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Mining for many decades served as an important component of countries revenue source especially for developing countries that have been endowed with the mineral wealth. If properly managed, countries can grow their economies with proceeds from mining activities in the form of royalties and foreign exchange earnings for the export of mineral related products. Such benefits from the mining sector have in most cases been used as justification and a social license for exploration and exploitation of minerals in most communities.

The study explores and assesses mining and its impacts on communities within which mining activities takes place. The focus has been on a mining community in Ghana called Asutifi South District of Ghana where mining is vigorously carried out by an American mining giant, Newmont Mining Corporation. The study investigates the real and underlying impacts of mining activities on the community in the light of the numerous promises and prospects that mining is said to provide for communities.

In as much as the mining sector have contributed and continually contributes to the economies of mineral endowed countries, one cannot lose sight of the fact that the very nature of mining itself in terms of the lifecycle of mining from discovery to closure seriously impacts on the lives of the communities in which it is undertaken. From the prospecting stages through the construction of mining infrastructure and the actual mining itself carries diverse impacts on communities that can very devastating on the one hand and developmental on the other hand. Usually some of the impacts are economics and environmental in nature and it is these impacts, real or imagined that this study sought to unravel.

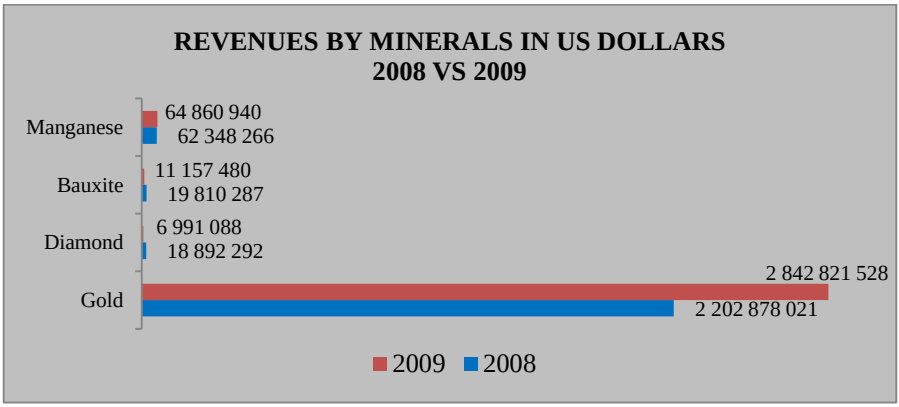

Figure 1. Economic impact of mining minerals in Ghana [2]

Mining is viewed as one of the important economic activities which have the potential of contributing to the development of economies. At the same time, the environmental, health and socio-economic impacts of mining on surrounding communities have been a major concern to governments, the general public and stakeholder organizations and individuals. Whiles the contributions of mining activities to economic development of Ghana is well acknowledged, others contend that the gains from the mining sector to the economy is achieved at significant environmental, health and social costs to the country [1].

The research examines the Economics and Environmental impact of mining in Asutifi District of Ghana. Some communities within the Asutifi district area were covered for the data needed for the research. A total of 75 respondents were contacted for relevant information through questionnaire administration and interviews. In addition, institutions and organizations that hold stake in the mining and related environmental and health issues were contacted for relevant data. Data collection problems included respondents' bias and reluctance to answer certain questions. These were tackled through segmentation of the target population and verifications from field observations.

The research revealed that mining activities have resulted in land degradation leading to limited land available for local food production and other agricultural purposes in the Asutifi district. In addition, there is pollution which has affected water resources in the area. Air and noise pollution are also evident in the area. The combined effects of environmental problems have culminated into health problems with high prevalence of diseases such as malaria, respiratory tract infections and skin diseases. The hypothesis that infection of malaria and respiratory infections among residents is inversely related to distance from the mines was confirmed.

In view of efforts at restoration and intervention measures by Newmont Ghana Gold Limited in the form of re-afforestation, review of methods of

operation and provision of alternative sources of drinking water to the affected communities, it has been recommended that the company revise its environmental management policy in the area to ensure that environmental effects of mining activities in the area are reduced to the barest minimum. In addition, it is recommended that the government, through the Asutifi district Assembly, build additional health centers, principally in all the villages close to the mining containment points to ensure adequate accessibility to health facilities. It is further recommended that the government of Ghana make conscious efforts to reduce the rate at which concessions are granted to mining companies in the country. All these measures should be fully integrated into the mining policy of the country

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THE MAIN APPROACHES TO STRUCTURE THE ECONOMY INTELLECTUALIZATION POTENTIAL

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The main approaches to measure economic potential are the resource one and functional one. The resource approach uses the structure and amounts of particular resources of the enterprise, administrative system or territory. This allows comparing the quantity and the quality of the correspondent resources types. At the same time it is not perfect way because available resources can be used with different efficiency. The functional approach, on the other hand, divides the elements of the system according to their functions, role in system existence or "activity types". This helps to assess the current situation in particular area of functioning (for example, logistical, marketing or production potential of an enterprise). The weak point here is that overall possibilities and capacities can be missed in current activities and therefore the main aspect of potential definition can be not taken into account. There is also mixed approach – the combined way to form a potential structure and take into account both available resources and their functional use. With this combined tool we can work on personnel, innovative potential or even integrated intellectual one.

Table 1 – Main Approaches to Structure the Economic Potential

Resource	Mixed	Functional
Natural resources Tools Working power etc.	Personnel potential Innovative potential Organizational potential etc.	Logistical potential Production potential Management potential Marketing potential etc.

In the age of frequent innovation and global changes the main competitive advantage is related to Organization's ability to create, accumulate, distribute and implement specific professional knowledge (or intellectual and innovative activities). Theoretical background of this starts from Vladimir Vernadsky's theory of noosphere (1944) which states that in the area of society and nature interaction the reasonable (intelligent) human activity becomes the determining factor of development. At the second half of XX century more and more scientists mention such level of world development as Knowledge Society. In economic sphere the "knowledge worker" according to Peter Drucker's definition (1959) is the one who works primarily with information or the one who develops and uses knowledge in the workplace. The following researches paid more attention to interpersonal interactions development potential. In his studying of society development Pierre Bourdieu (1983) distinguishes three forms of capital: economic, cultural and social. A little different view on social capital and its definition showed Coleman and Becker in their works related to social networks influence on state performance (Coleman, 1988; Becker 1996) Particularly in the field of intellectualization of social capital Vladimir Inozemtsev's concept of post-economic society and intellectuals' elite (Inozemtsev 1998) should be mentioned. As far as social and economic conditions for society of knowledge in Ukraine is concerned, work of prof. V.M. Heyets represents a valuable overview (Heyets, 2005)

Business intellectualization analysis at the level of enterprise: classification and description of knowledge management systems, expert innovation teams, role of social networks and creative environment creation etc. - is particularly interesting for us in so called "talent management" concept (Poell and Van der Krogt, 2008)

Finally, World Health Organisation's definition of health "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (Constitution, 2006) make it possible to include intellectual needs to general human health factors for the sustainable socio-economic development.

Dealing with economy intellectualization potential in the sustainability context we need to take into account the way natural resources are used within particular economic system. According to our hypothesis it is determined by the direction, spread extent and intensity of the intellectual and innovative activities

within correspondent socio-eco-economic system (for example, region, state or province).

Thus economy intellectualization process should start with health and educational training of future innovators, development of their creativity towards sustainable future, go through the scientific research results and end only with taking into account implemented innovations and their effect on the local, regional and state environmental situation according to the ecological balance principles.

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THE IMPACT OF EMERGING SUSTAINABLE TECHNOLOGIES ON EXISTING ELECTRICAL INFRASTRUCTURE IN ONTARIO

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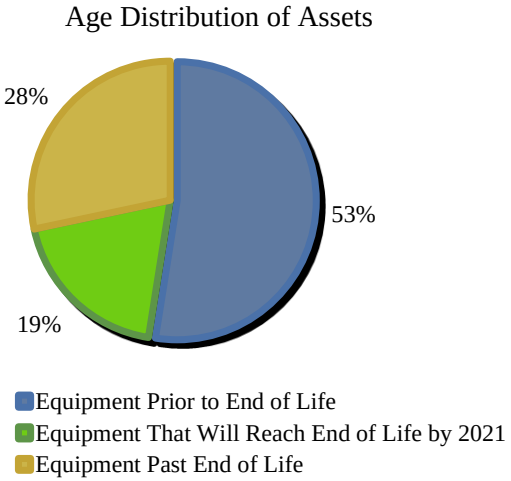
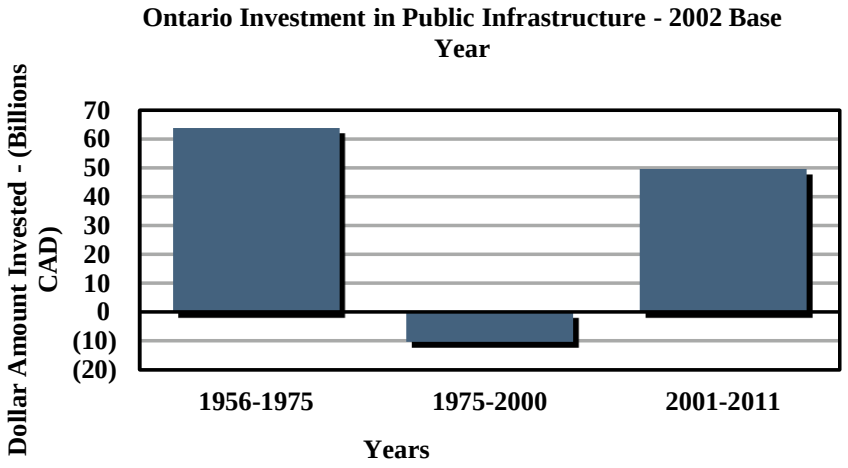
Sustainable energy sources are urgently required, as traditional non-renewable energy sources are increasing in scarcity and subsequently in cost. Significant innovation and investment is required to incorporate newly developed sustainable energy technologies into the existing energy infrastructure network. This presentation will review how emerging sustainable technologies are interacting with existing energy infrastructure. Specifically it will review the existing electrical grid in Ontario, Canada, and the impact of sustainable technologies such as electric cars and distributed generation.

Through the past two hundred years the world has seen unprecedented economic growth with the onset of the industrial revolution. This growth was sustained through increased dependance on non-renewable resources, first with coal, then moving into oil and gas. Typically very little attention was paid to the long term sustainability of the dependance on low cost energy, it was simply known that where low cost energy was available, industry was able to flourish. As these resources have been depleted, the costs to gather and transport energy has increased, making the cost of production higher. This has driven innovation to develop ways to conserve and create energy resources. One major innovation to reduce the use of petrol as a fuel is the development of the electric car, while



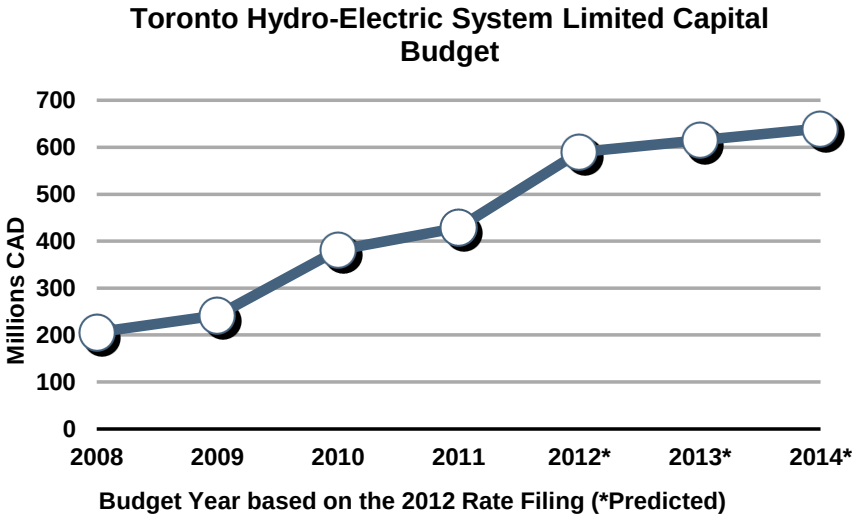
another major innovation is the small scale gathering of energy from renewable resources such as solar and wind. Both of these innovations reduce dependance on traditional energy sources, but put unique stresses on the existing energy infrastructure that has been constructed over the past 100 years.

In the province of Ontario, a large portion of the existing public infrastructure, including electrical infrastructure, was installed during the post war boom in the 1950's and 1960's. This was an era of abundant government spending and prosperity as the world rebuilt from the travesties of war. Once the infrastructure was installed, the infrastructure was allowed to run with minimal additional investment. The low cost of running new infrastructure was reflected in the taxes and energy costs provided to the people of Ontario. The government developed a monetary policy based on the maintenance needs of the existing infrastructure installed, and accounted for minimal capital investment. While the infrastructure was relatively young, this policy provided maximum benefit to the consumers, but set the system on unstable footings for future years. 'Ontario Investment in Public Infrastructure' shows government investments in public infrastructure over three time periods (Fagan, 2012). The dollar amounts take into account depreciation of the physical assets. Between 1975 and 2000 the amount of capital investment was less than the cost of depreciation of the assets in service, resulting in a negative investment. This trend is highlighted in 'Age Distribution of Assets', which shows the age of physical assets installed in Toronto, owned the local distribution company Toronto Hydro-Electric System (Toronto Hydro Corporation, 2012).



The majority of the public infrastructure had minimal capital investment between 1975 and 2000, thus much of the system is currently utilizing technology that is from the 1950's and 1960's. In addition to the antiquated technology, the amount of energy that could be transported through the infrastructure was built based on growth projects from the 1950's and 1960's. These projections were based on the socioeconomic climate of the time and were intended to be utilized until the end of of the equipment life. As shown in 'Age Distribution of Assets', much of the equipment is at, or nearing, end of useful life. Growth rates and patterns have also changed since the initial predictions were done, most notably with the high rise boom in the late 1970's and then again in the 2000's. Areas that once were low-energy use industrial areas have become vast high rise complexes that consumer incredible amounts of energy. In addition to the aging equipment and change in growth patterns, innovations and technological advances have put stresses on the electrical infrastructure that were never imagined. Electric cars are being introduced onto the grid, which add a load equivalent of a typical residential customer. This changes the energy usage patterns and may affect the long term life of assets due to the increased usage.

Technology has advanced to the point where individual consumers are able to purchase an install equipment that harnesses energy from renewable resources such as solar and wind. These customers are then able to input power into the grid as well as use it when required. The electrical grid was initially set up to have power



flow in one direction, from the main generation plant, through the sub-stations to the consumers. Now there are many tiny generation points across the electrical grid inputing small amounts of electricity back into the electrical grid at various times. This is known as distributed generation.

To replace the failing infrastructure, modernize the existing infrastructure and maintain reliability, electrical distribution corporations have increased their capital budgets, as shown in 'THESL Capital Budget' (Toronto Hydro Corporation, 2011). This increases the cost of energy to the consumer, but is essential to allow for innovation and sustainable power.

Without changes and modernization of the existing electrical infrastructure, emerging sustainable energy innovations will not be able to be utilized to their full potential.

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ECOTOURISM AS PERSPECTIVE WAY OF PERM REGION CULTURAL AND ECONOMIC DEVELOPMENT

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2013 was declared as the Year of Environment in Russian Federation.

In Russia there are more than 3 000 of reserves and other specially protected natural areas (SPNA). [1] Recall that the SPNA is land parcel, water lot airspace segment over them, where natural complexes and objects that have special natural protection, scientific, cultural, esthetic, recreational and improving value, that are withdraw by public authorities decision fully or partly from practical use and for that the mode of special protection is established. [2] It is worth to say that the "special protection" should not mean "closed to the people." Therefore it is necessary to solve the problem of people' environmental education with the development of the regional economy. This problem can be solved by ecotourism as the rapidly developing service.

Tourism – one of the sectors of the economy, particularly useful for people. It enables a person to relax, satisfy their natural need and it does not lead to the depletion of natural resources.

Ecotourism is responsible travel to natural areas that conserves the environment and improves the well-being of local people. [3]

Ecotourism – tourism, including travel to places with relatively untouched nature, in order to get an idea of natural, cultural and ethnographic features of the area that does not affect the integrity of the ecosystem and create an economic environment in which the conservation of nature and natural resources is profitable for local people. [4]

There is the law of the Russian Federation, which regulates the tourism activities. In this case, from the point of view, tourism is a business that allows you to adjust revenues to the regional budget. [5]

Ecotourism involves not only visiting unique natural areas and environmental education, development and maintenance of environmental culture of tourists, but also an active nature conservation of visiting places.

Ecotourism is required more than other types of tourism. Ecotourism is not only a way to enjoy the wildlife. It is necessary to correct hiking trails, to reduce the amount of garbage. It is also important to work closely with the local community, to act with their consent and share their socio economic benefits.

Russia has a vast territory for organizing ecotourism routes. Ecotourism is a socially beneficial activity. It will not only financially benefit for entrepreneurs, but will be beneficial for the protection of nature. For example, ecotourism can be financially beneficial for the state nature reserves. Investments will be aimed in the development of ecology, the acquisition of environmental professions, the development of local crafts, unique folk culture.

Perm Region is attractive for tourism. The significance of the area combined with a compact configuration and geometric central position of the main city. Already established image of the northern territory of Russia will develop ecotourism, which every year becomes more and more popular.

Local small business can benefit from this trend. In Perm you can create a whole new trend in the tourist business. The Region is located on the boundary of the foothills of the Ural, which is manifested in the chains of cities. This boundary of foothills is complicated and consists of two lines, along which are located the cities. The first line is between the plains and foothills, is near the city Cherdyn, Solikamsk, Berezniki, Dobryanka, Perm, Kungur, the second line is between the foothills of the mountains and leads through the city Krasnovishersk, Kizel, Gubaha, Chusovoy, Lysva. Area has geological and geomorphological heterogeneity. Tectonically there are three major distinctive parts: the Precambrian platform, tectonic flexure and Hercynian fold belt. Tectonic flexure zone acts as a resource, as it concentrates large mineral reserves and especially salts. The relief

has two different habitat: flat, but with a high degree of compartmentalization (Russian Plain) and a mountain of middle and low mountains (the Urals).

Ural mountain is traditionally one of the most popular region for tourism. Picturesque mountain peaks rising above the taiga, the stone ruins of the geological history, rock labyrinths, clean and full of rapids river are the Heritage Permian mountain nature, highly valued by today's travelers. Interesting hiking trails are laid to the mountain tops of the North and Middle Urals. Tourists are familiar with ridges of the highest point Tulymsky stone (1469m.), alpine meadow of the ridge Kvarkush that are like the ruins of an ancient castle, mazes of Stone Town.

The Northeast region is not a separate mountain peaks, but gives the impression of a mountainous country. Plain of Prikamye is decorated with hills. The great White mountain is impressed with its mightiness.

Obviously that without bringing in ecotourism framework of environmental management, marketing, advertising elements and public relations situation will not resolved. Moreover, eco-tourism is just one of the types of tourism and it can and must make a long-awaited and such necessary financial resources to the regional budget. Russian business can and must to solve the ecological problems.

There are also serious problems of implementation of ecotourism in the region, which are connected with the mentality of both tourists and villagers, which in many ways are not for ecotourism (and tourism in general) next to their houses, river, field. Therefore, ecotourism is perspective way of economic, environmental and cultural development of the Perm region.

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THE DEVELOPMENT OF SUSTAINABLE LAND USING AS A STRATEGIC PRIORITY OF MODERN AGRICULTURE

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Agriculture is still a sector of the economy in which the outcome of economic activity has a probabilistic nature and can't be accurately predicted. Besides economic processes, the uncertainty of the operating systems in the industry I connected with the specific land use as a production factor. The productive part of land (soil) forms a crops yield under the influence of simultaneous multiple, sometimes differently directed, factors group interaction. Factors group includes genetic characteristics of crops, weather and climatic conditions of the environment (humidity, temperature, pressure, etc.), the activity of living organisms. Therefore, the impact of humans on the labor subject is not decisive in this case.

However, in recent years, namely the human impact is a major threat to the natural resources of agriculture in Ukraine. Failure science-based crop rotation, no systematic reproduction of soil fertility leads to the agrosocioecological systems destruction. Intraindustrial destabilizing factors currently gained national importance and defined as major risks of present and future economic stability in the industry.

Nature elements, which are directly or indirectly used in the production at the agricultural enterprise, a group of companies within the same administrative unit, region or a whole country, make natural resource potential of appropriate localization level. The rationality level of land using should be viewed through the prism of land use efficiency ability that are in use in agricultural enterprises (associations, industry). Also it should provide a long term sustainable yields from existing internal and external constraints due to the dynamics of their reproduction.

The strategic priority is to build an industrial model of agriculture, which would be supported by the ecological balance and benefit balance between financial and social interests. In this aspect, rational system of land using must be tempered by such directions: "input resources" – "output production" – "compensatory influence".

Soil as a natural formation is changed by biotic influence physical, chemical composition, etc. during the production operations implementation. They aren't traced even within one field. However, the total index of land use systems balance (namely resources balance) should be a subject to continuous monitoring of the enterprise's strategic management.

Land use equilibrium of the "persistent" type (position *A* in Fig. 1) provides a way of production organizing, in which the parameters balancing costs and benefits are obtained by self-regulation. The average impact *Fi* on the system productivity

of the i^{th} factor (natural, anthropogenic influence) has a direction for productive land properties saving ($\sum \overline{F_i} = 0$).

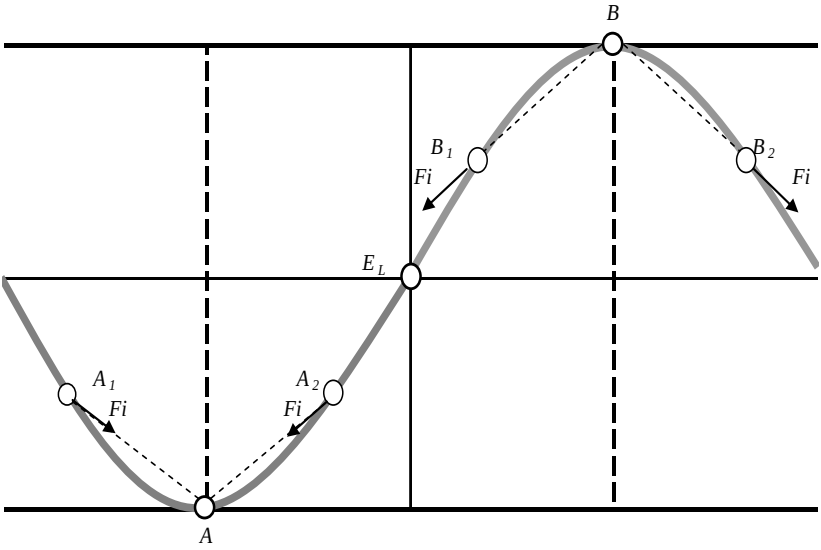

Figure 1. The level of land use systems balance

At the equilibrium of "unstable" type (position *B*) and rejecting the system parameters from the values that provide yield indexes reproduction (positions B_1, B_2) at the beginning of operations, forces *Fi* are acting, seeking to increase this deviation. Change in direction and character of productivity factors oscillations depends on the equilibrium E_L threshold. It is determined firstly by the degree of environmental safety (for example, values of erosion hazard) of the current system of land use. This causes irreversible changes in the configuration of the productive mutual influence factors. The equilibrium deprivation in at least one direction leads to imbalance in the system "resources" – "results" – "compensation" in general.

So, it is necessary to ensure a balanced land use systems and timely prevention of risk of soil fertility losses in order to prevent reduction of natural resources, particularly the land and resource potential in the industry. The identifying of these risks is a strategic prerequisite for the successful development of agriculture in Ukraine.

URBAN ENVIRONMENTAL PROBLEMS (NIGERIA)

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While there is now widespread agreement that urban environmental issues are important, there is little coherence in how international agencies and others define the urban environment and identify its critical problems. This is not just a semantic question, as it is intimately related to how and where funds are allocated and to who can expect to benefit from the resulting environmental improvements. Most of the confusion arises from the qualifier 'environmental' and what it should mean in an urban context.

If urban environmental problems are defined and pursued too broadly, then almost all urban development initiatives can be labeled environmental. For example, Einstein's oft-cited definition of the environment as 'everything that is not me', could be used to designate anything from better shopping facilities to better televisions as urban environmental improvement. There is no doubt that technological advances in agriculture, industry, and transportation greatly improved man's way of life. However, these activities, while providing the raw materials for production of goods and services have also resulted in pollution of land, atmosphere, vegetation and rivers (Okojie, 1991). The Nigerian environment today presents a grim litany of woes. Every state of the federation suffers from one form of environmental problem or the other in varying degrees. The northern part of the country is being literally "blown away" by wind erosion while the southern part is being washed away into the ocean. Between 1976 and 1988, a total of 2,000 reports of oil spillages were recorded with the discharge of two million barrels of oil into the environment (Ikporukpo, 1988). Urban cities and town in Nigeria are increasingly threatened by pollution of air and water and improper disposal of solid wastes while the rural areas are plagued by soil erosion, deforestation, and bush.

Over 2 million tons of soil are lost annually in south- central Nigeria, and this has cause great decline in agricultural yield (Dike, 1995). According to the NNPC (2010), a large proportion (about 63%) of the gas produced in Nigeria is being flared. By 2002 and 2003, gas flared remained as high as 45.4% and 42.7% while gas used was 54.6% and 57.3%, respectively. The economic costs in terms of lost incomes and reduction in the standard of living can therefore, be expected to be staggering. Nigeria's Niger Delta covers 20,000 square kilometers within wetlands of 70,000 square kilometers formed primarily by sediment deposition .The Niger Delta environment can be broken down into four ecological zones: coastal barrier islands, mangrove swamp forests, freshwater swamps, and lowland rainforests. This incredibly well-endowed ecosystem contains one of the highest concentrations of biodiversity on the planet, in addition to supporting copious flora and fauna, arable terrain that can sustain a wide variety of crops, lumber or

agricultural trees, and more species of freshwater fish than any ecosystem in West Africa. The region could experience a loss of 40% of its inhabitable terrain in the next thirty years due to extensive dam construction in the region. The carelessness in the oil industry has also precipitated this situation, which was perhaps best described in a 1983 report issued by the Nigerian National Petroleum Corporation (NNPC) stating that: "we witnessed the slow poisoning of the waters of this country and the destruction of vegetation and agricultural land by oil spills which occur during petroleum operations. But since the inception of the oil industry in Nigeria more than twenty five years ago, there has been no concerned and effective effort on the part of the government, let alone the oil operators, to control environmental problems associated with the industry".

The rapid urbanization and increase in the population resulted in the depletion and degradation of natural resources. Industrial expansion lead to the increase in the job potential and trade prospects in large cities, which attracted the rural population to migrate to cities and this, further converted the cities into a major slum and concrete jungles. According to a study by the United Nations, the level of urbanization has been estimated to cross 50% in 2005 and 60% by 2025. It has projected the world urban population by 2025 to be 5.2 million, of which 77% would be living in developing countries (United Nations, World Urbanization Project, New York, 1993). Rapid urbanization is expected to continue. Projections show Countries of the Asia-Pacific region are no exception, given their very high population growth rates. Nine out of the world's thirteen mega-cities, with populations exceeding 10 million, are in Asia. The population in the region is expected to reach 4.8 billion by the year 2025 and 5.3 billion by the year 2050.

However, we shall expect the unsafe side of the environment which could be, increased traffic congestion in the cities. Lack of in adequate sewerage treatment facilities, drinking water, encroachment of open spaces, littered garbage in the streets, polluted coastal seawaters are some of the evils of modern urban environment. The water in the rivers became unfit for human consumption due to the constant flow of untreated sewerage and effluents.

The management of urban environment problems is a complex one, there has been an effective effort to resolve the problems which in particular concerns the dynamic society and indeed has improved the understanding of the people in it to a certain level and they include: capability, technologies, financing options, parks and greeneries, increase co-operation and partnership. Rivers and seas should also be protected and dumping of waste into the river and sea should be prohibited. There is a need to monitor carefully these new initiatives, and detailed studies are required to examine the factors influencing the Success and failures of the partnership approach.

INDUSTRIAL ECOLOGY: A PANACEA FOR ENVIRONMENTAL DEGRADATION

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Resource demand and environmental degradation have reached unsustainable levels. A sustainable future requires industrial systems' attention and improvement. Industrial ecology springs from interests to integrate the notions of sustainability into environmental and economic systems (Allenby 1992). The fact is that the economy operates as an open system, drawing raw materials from the environment and returning vast amounts of unused by-products in the form of pollution and waste. The products that firms market are only a small portion of what their processes turn out; a significant portion of their output eventually leaves the economy as waste and returns to the environment in forms that may stress it unacceptably. (Ehrenfeld & Gertler, 1997). Increased economic output will still cause increased environmental harm. Thus, accomplishing economic growth and environmental protection simultaneously requires fundamentally new ways of examining and designing socioeconomic systems. One way to achieve this is through industrial ecology

Industrial Ecology is the scientific study of environment and its organisms with respect to their abundance, habitat, interaction, climate and distribution. Thus it, studies the physical, chemical and biological interactions and relations between the industrial processes and ecosystems. It evaluates the effects of industrialization on the environment. The study revolves around the flow of materials from industrial processes into the nature - the way in which industrial systems interact with the biosphere.

The objective of Industrial ecology is to reduce the negative impact of industrial process on nature, thereby clearing off the threat posed to the environment at the same time diverting industrial systems towards a more sustainable approach. It is concerned with the shifting of industrial process from linear (open loop) systems, in which resource and capital investments move through the system to become waste, to a closed loop system where wastes can become inputs for new processes. Industrial activity based on such an ecological conception can greatly reduce harmful impacts associated with pollution and waste disposal, while easing the drain on finite strategic resources. Familiar practices such as reuse, remanufacture, and recycling represent a move in this direction.

Industrial ecology as a panacea for environmental sustainability applies the following approaches.

Firstly, it draws on and extends a variety of related approaches including systems analysis, industrial metabolism, materials flow analysis, life cycle analysis, pollution prevention, design for environment, environmental impact

assessment, product stewardship, energy technology assessment, and eco-industrial parks. All these variables will provide a long-term perspective, encouraging consideration of the overall development of both technologies and policies for sustainable resource utilization and environmental protection in the future. They will emphasize opportunities for new technologies and new processes, and those for economically beneficial efficiencies. The outcome of these processes will be greater material efficiency, the use of better materials, and the growth of the service economy which would contribute to the "dematerialization" of the economy. Resources that are cheap, abundant, and environmentally beneficial, may be used to replace those that are expensive, scarce, or environmentally harmful. Such a substitution can be seen in the many important changes in energy sources that have occurred over the past century. As the energy sources have shifted from wood and coal toward petroleum and natural gas, the average amount of carbon per unit energy produced has decreased significantly, resulting in the "decarbonization" of world energy use.

Secondly, industrial ecology adopts the use of waste products as raw materials. These efforts often come into conflict with concerns about hazardous materials in the wastes, such as the concern that trace metals in ash from power plants recycled in fertilizer may contaminate soil. However, a well planned waste reuse has always been successful. In the industrial district in Kalundborg, Denmark, several industries, including the town's power station, oil refinery, and plasterboard manufacturer, make use of waste streams and energy resources, and turns by-products into products. There are many examples of technological innovations that have had significant environmental benefits. An important example is the replacement of chlorofluorocarbons (CFCs) with new compounds in order to protect the stratospheric ozone layer. Other examples are the elimination of mercury in batteries, and the elimination of lead in gasoline, paint, and solder.

Thirdly, Industrial ecology advocates the substitution of service for product as a way of reducing environmental impacts, meaning that customers do not seek specific physical products, but rather the services provided by those products. For example, an integrated pest management service might provide crop protection rather than selling pesticides. The service thus saves money and the ecosystem by using only as much pesticide as needed.

The challenge of industrial ecology is to understand how technological and social innovation can be harnessed to solve environmental problems and provide for the well-being of the entire world. Thus, effective implementation of the various methods of Industrial ecology as mentioned above will encourage the ecosystem sustainability and help secure our environment. Each one of us can contribute to a safer world and save our planet by being a part of the revolution against environmental degradation through industrial ecology.

EDUCATION – WAY OF ENVIRONMENT SOLUTION

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If you try to compare the economic and environmental indexes of our time, we can note that they reflect two opposing trends. On the one hand, during the second half of the twentieth century there was significant increasing of the world's gross product and the volume of world trade. On the other hand, the accelerated degradation of life supportssystems: forests and soil, atmosphere, water resources, and the most important - reducing genetic diversity of life on Earth.

Statistics show us that in millennium junctionfrom all world population 70% - are illiterate, 50% - malnourished, 6% are holdingwith 50% world output, and only 1% havehigher education. It demonstrates us dramatic disparitiesexisting in the world: on the one hand, the privileged wealthy minority, on the other - remains in hopeless distress, malnourished and uneducated majority. To overcome these difficulties and the survival of humanity it is more than ever necessary policy measures and development of education.

When education is aimed to the future, and where the future of everyone connected with the future of whole planet, education must contribute to the solution of global problems. At the same time, many people do not realize the close connection between human activities and the environment, as they do not have enough information. Hence, there is a need to increase the susceptibility of people and their participation in the search for solutions to the problems of development and environmental conservation.

Basic education is certainly the foundation for understanding the issues of development and environmental protection. It is advisable to further improve the education for sustainable development. In my project I want to present some aspects of the problem decisions:

providing education on the development and preservation of the environment for people of all ages;

inclusion of the development concept and environmental protection in all educational programs;

ensuring of the involvement of schoolstudents, colleges and university students in local and regional studies of the environment, including safe drinking water, sanitation, food and environmental implications of the use of natural resources.

Important issues of education, training and public awareness should be addressed legislatively at the state and regional levels. It should be encouraged all sectors of society, including industry, universities, governmental and non-governmental organizations for training in environmental management. Very important work with the media, and representatives of the entertainment and

advertising industries to promote more active people participation in the discussion of environmental issues and sustainable development of society.

Global education should be based on a philosophy of cooperation between people and their understanding of the interests of the whole nature. It was such philosophy, which V.I.Vernadsky wrote: "... a new lifestate on our planet, dreamed by utopians become a reality when the war, hunger and malnutrition may relatively quickly disappear from our planet ".

WATER POLLUTION

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It is hard to imagine and believe that 75% of the earth is covered with water; and its inhabitants are not satisfied with clean water to drink and other home uses. Some people in Africa travelling hundreds of miles every day to fetch clean water from a hole that was not properly drilled and that with only a bucket that cannot meet daily needs. On the other hand the human body is 70% water too, and when exposed to dirty water, diseases erupt (epidemics) which lead to 3.4million deaths of people each year. And Nearly 99% of deaths occur in developing the countries.

Water pollution is the contamination of water bodies such as oceans, lakes, rivers, and ground water with undesirable foreign matter caused by human activities, which can be harmful to organisms (animals, plants and humans). Pollution comes in many forms: some conventional and others toxic.

Causes of water pollution:

Urbanization: Rapid urbanization in the world during the recent decades has given rise to a number of environmental problems such as water supply, waste water generation and its collection, treatment and disposal. Many towns and cities which came up on the banks of rivers have not given a proper thought to the problems of wastewater, sewerage etc. In urban areas, the wastewater is let out untreated and causes large scale water pollution.

Industries: Most of the rivers and other sources of fresh water are polluted by industrial wastes or effluents. All these industrial wastes are toxic to life forms that consume this water. Thermal power plants, engineering industries, paper mills, steel plants, textile industries and sugar industries are the major contributors of wastewater production.

Agricultural runoff and improper agricultural practices: Traces of fertilizers and pesticides are wasted into the nearest water bodies at the onset of the monsoons or whenever there are heavy showers. Intensive and ever increasing usage of chemical fertilizers, pesticides, and other chemicals cause water pollution. Flood-plain cultivation is another significant contributor to water pollution.

Diarrhea is defined by the World Health Organization as having three or more loose or liquid stools per day, or as having more stools than is normal for that person.

Worldwide in 2004 approximately 2.5 billion cases of diarrhea occurred which results in 1.5 million deaths among children under the age of five. Greater than half of these were in Africa and South Asia. This is down from a death rate of 5 million per year two decades ago. Diarrhea remains the second leading cause of infant mortality (16%) after pneumonia (17%) in this age group.

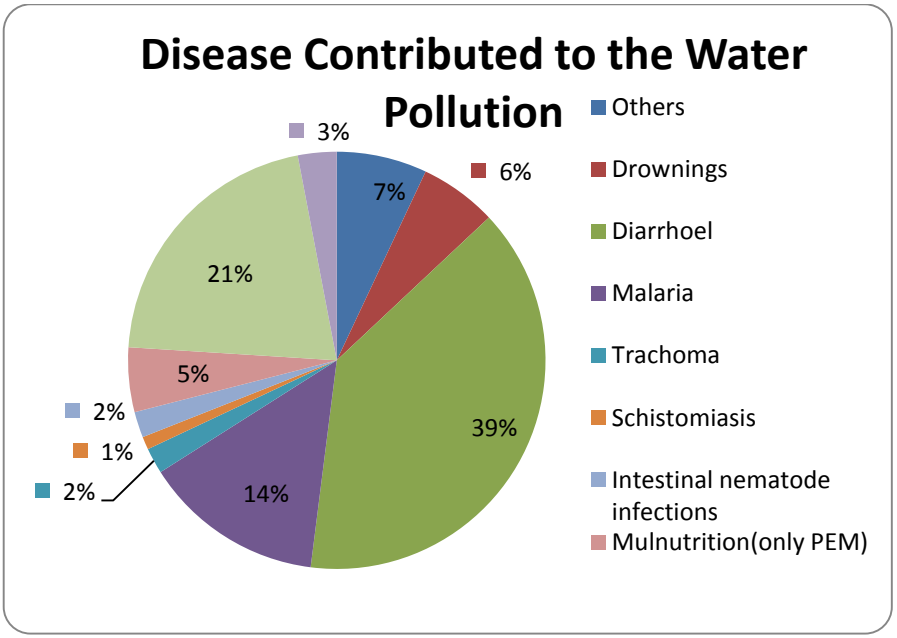

Figure 1. Desease contributed to the water pollutin

The cost of these diseases is the loss of labor power, over spending of government in controlling the disease and its spreading when it's erupt, decrease in production and for the countries with tourism activities also experience the decrease the number of tourist in that particular country. All of these sum up to slow economic growth and deterioration of economic activities.

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INTEGRATING ENVIRONMENTAL PRIORITIES IN THE DEVELOPMENT OF ENTERPRISES CHEMICAL AND PETROCHEMICAL INDUSTRY OFUKRAINE

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Chemical and petrochemical industry in Ukraine is characterized by a large number of companies with a high degree of environmental hazards. The variety of products, technologies and materials are causing a wide range and relatively high concentrations of pollutants in the environment surrounding the person because environmental priorities in the chemical and petrochemical industry are the necessary prerequisite for ensuring of their ecosafety development.

There are main causes of significant impact of industrial and economic activities of chemical plants on the environment and human health. These are [1-3]:

1) High volume production. Chemical production provides about 7% of industrial production and 6.8% of exports of goods; there are more than 4,200 enterprises, there are busy about 159 thousand people or 5.6% of the production personnel industry [1].

2) Placement of chemical plants. In areas of high concentration of chemical production is a significant increase in the concentration of pollutants in all environmental components (air, water, soil) and worsening health.

3) Specificity of chemical production and characterization of the raw materials, which is uses in this case. In chemical plants in large quantities are toxic and explosive materials from which produces significant in volume and variety of names of chemicals whose properties are not studies.

4) Low technological level. Number of technologies with high energy and materials consumption are twice or three times greater than that in developed countries.

5) Worn out equipment. Each year, depreciation of equipment grows: from 68.6% in 2009 to 68.2% in 2010 and 66.8% in 2011. Moral deterioration estimates reaches 80-85% [1].

6) Imperfection legal and economic mechanisms and others: there are undeveloped environmental insurance, credit, environmental audit, etc.

7) There are lacks of consciousness, culture, environmental of education.

The activity of chemical enterprises affects not only the environment but also on production and economic activity of the enterprise itself, slowing its growth, reducing competitiveness and image in the international market and so on. Therefore, as of today, and in the future, environmental factors we must to consider as a priority during. For improve the environmental performance of the chemical complex we must to do the next. We must:

• To improve traditional methods of production chemicals for waste generated in the operation of Company;

• To build new, renovation and improvement of existing treatment facilities;

• To active decommissioning of environmentally hazardous industries, morally and physically obsolete technology and equipment;

• To create and use to new low-waste technologies and resource;

• To improve methods of recycling and disposal of hazardous wastes that have accumulated for many years in the landfill, sludge ponds, etc.;

• To expand the use of waste generated or already accumulated by developing the necessary technology and material to rebuild balance sheets and build on this basis sectoral clusters of commodity closed cycles;

• To direct chemical complex development projects on environmental priorities and strengthen their economic levers of influence on public entities through payment for the use of natural resources and damage caused to the state of the environment as in the average European standards.

In our view, the key issues for further development of chemical complex in the coming years are to create conditions for the transition to ecologically-industry investment, an innovative model of development, which should include the diversification of current production, using domestic raw materials, the domestic market domestic chemical products, due to import substitution and energy efficiency projects, using modern energy-saving technologies, involving relevant resources for potential investors, shareholders and business partners.

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THE DEMOGRAPHIC SITUATION IN THE NORTH CAUCASUS FEDERAL DISTRICT IN THE FIELD TO REDUCE MORTALITY

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Demography (etc.-Greek δῆμος - people, etc.-Greek γράφω - write) - a science about laws of reproduction of the population, depending on the nature of the socio-economic, natural conditions, migration, studies size, geographical location and composition of the population, their changes, causes and consequences of these changes and giving recommendations for their improvement.

Over the past decades General demographic situation in the country stabilized as a result of the increase in the growth of fertility, lower mortality and intensive migration processes. In the North-Caucasian Federal district population c1990-2012 increased by 2.21 per million people. At the beginning of 2013, the population of the North-West Federal district amounted to 9 542 640 people. [1,c.234]

Long-term dynamics and the importance of a large number of the main socio-demographic indicators in the North-Caucasian Federal district is significantly different from the dynamics and values of the respective indicators in Russia on average.

The mortality rate is one of the most critical demographic processes after birth. It is the study of this indicator is able to exert influence on the population, on its size and structure.

The most important and priority directions of the study of the statistics of deaths and death rate is:

• analysis of the current demographic situation and trends of its change;

• definition of the policies and actions of the other, except health care, spheres of activity;

• satisfaction of the needs for information on changes in the population in connection with various professional and commercial activities.

The mortality rate in the North-Caucasian Federal district, the lowest in the Russian Federation - 8.2 of the person on 1000 person of the population in 2012. At that, as of July 2012, according to the CIA, Russia occupies eleventh place among the countries of the world in terms of mortality per 1000 persons of population (14,1). Mortality among Russian men and women in working age above the European average. However, the infant mortality rate in Russia is only slightly

higher than the average in Europe and is 8.1 died before the year per 1000 live births.

The lowest values of the indicators of mortality per 1000 people of the population recorded in 2011 in the Republic of Ingushetia (3.7 per person), Chechen Republic (5.3 per person), the Republic of Dagestan (6.1 persons). In other subjects of the Russian Federation, members of the North-Caucasian Federal district, the value of this indicator also below the national average.[2,94]

Each phenomenon has its explanation, so there are the main causes of the situation with the mortality rate. The main reasons threatening the life of mankind at the present time, in particular in the North-Caucasian Federal district, are:

- Alcoholic drinks.
- The level of violence in society.
- Road traffic accidents.
- Bad ecological conditions. [2,104]

For the North-Caucasian Federal district the main challenge is the high infant mortality, but at that, thanks to the success of health in the last while led to a significant improvement of this indicator.

The developed and approved the development Strategy of the North-Caucasian Federal district up to the year 2025 (from 6.09.2010г. №1485-R), which determines the main directions, methods and means of achievement of strategic goals of sustainable development and of ensuring the national security of the Russian Federation on the territory of the Kabardino-Balkarian Republic, Karachaevo-Circassian Republic, the Republic of Dagestan, Republic of Ingushetia, the Chechen Republic and the Stavropol region, included in the composition of the North-Caucasian Federal district, up to the year 2025. The main aim of the Strategy is the provision of conditions for accelerated development of the real sector of the economy in the regions of the Russian Federation, members of the North-Caucasian Federal district, creation of new workplaces, and also to improve the level of life of the population. [3]

Thus, the demographic situation, which has developed in the North-Caucasian Federal district is significantly better than in the whole of the Russian Federation. Distinctive indicators North-West Federal district is a positive natural growth and high levels of fertility. So, family and demographic policy in a given district is a highly effective, which has a positive effect on the demographic situation in the country, and as a result, Russia should move in this direction.

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NEW TECHNOLOGICAL PATTERN REBOUND EFFECT FORECASTING

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The modern mechanism of natural management and environmental protection can cause delayed reaction of the economy on ecological issues while changing technological pattern in long-run if it is oriented only on current economic structure.

According to Glazyev S. overcoming the crisis and economic growth tempo acceleration must rely on transformation from raw material export to innovative type of development, achieving the nanotechnology wave of technological pattern [1]. Life cycle of such pattern can be graphically described by S-shaped logistic curve and consist of three phases illustrated on figure 1.

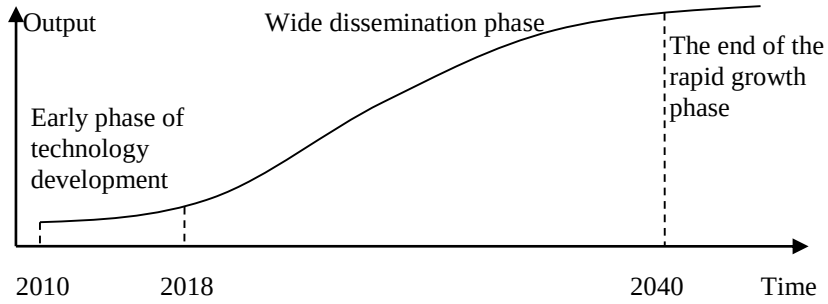

Figure 1. Nanotechnology pattern by Glazyev S. [1]

It should be expected that implementation of new technologies will be connected with natural management system transformation by changing of structure of raw recourses utilization, environmentally harmful processes and their consequences. The development of single technology is likely to be connected with its efficiency improvement, its end product price reduction, economical growth and consumer welfare increase.

In this context the probability of rebound effect rising becomes considerable. In general it should be expected that the greater the difference between the current consumption level of single nanotechnology product and its saturation level, the greater the expected value of rebound effect. The main explanation of this phenomenon is linked to opposite directions of micro and macroeconomic development vectors, enclosed in Khazzoom-Brookes postulate: improving of resource utilization efficiency at the micro level leads to higher level of its consumption at the macro level, than in the absence of such improvement [2].

The second phase of new technological pattern which dates back to 2018–2020 can be considered as a phase with the greatest potential danger for economic and ecological interest balance.

For the produces efficiency improvement means price reduction without changing the scale of production, the release of working capital. There are two possible ways for redistribution of this capital: the extended production of final product or/and diversification of production. Both ways mean the enlargement of resource utilization.

For the consumer the effect will be similar. As the income increase it encourage him to raise the level of consumption of a new technology product, or, in the case of saturation, to diversify consumption, causing the appearance of a rebound effect for the product of nanotechnology or for other products.

The beginning of wide dissemination phase of a new technological pattern is foreseen in the early 2020. Before the beginning of this phase or on its certain time interval the possible negative consequences of the new technological pattern may be implicit, but ignoring possible trends can lead to significant impacts that have to be considered.

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THE IMPACT OF WORLD TRADE LIBERALIZATION ON POLLUTION

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World trade liberalization has a multifaceted impact on economic and social indicators and they by-turn affect environmental performance. The links between world trade liberalization and pollution are ambiguous and often difficult to determine because of the variety of ways of mutual influence. We divide those trade-pollution links into two groups.

The first group of links between trade and environment includes the impact of trade on environment through its impact on income, on the amount of production and consumption. Economists first of all emphasize the positive effect of trade liberalization on the economy in the form of income growth. Most studies in the

sphere of environmental economics confirm that the growth of per capita income raises demand for environmental quality. Growing demand for environmental quality shifts the structure of consumption toward more ecological goods, makes environmental regulations more stringent and raises standards. This results in pollution reduction, as it should be according to the environmental Kuznets curve. However, income growth promotes the growth of consumption. If the demand for environmental quality is insufficient, the growth of consumption-generated pollution prevails (Fig. 1).

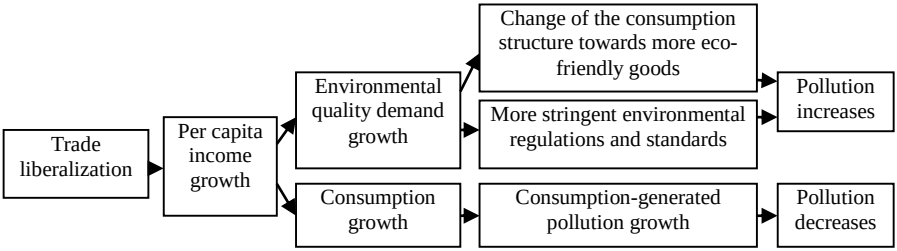

Figure 1. The impact of trade liberalization on pollution due to income per capita increase

Another economically positive consequence of trade liberalization is the increase of an output. As the result of the increase of an output the production-generated pollution rises. Economies of scale causes reduction of prices, which leads to increased consumption and thus consumption-generated pollution rises too. But there are also environmentally sound consequences of the economy of scale. It can reduce the materials consumption of production, helping to conserve resources (Fig. 2).

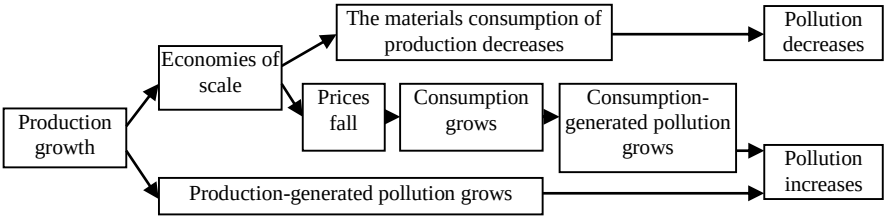

Figure 2. The impact of trade liberalization on pollution due to increase of an output

The second group of links between trade and the environment includes the impact of trade on the environment regardless of income level. When the income is

constant the impact of trade liberalization on the environment depends on the situation on the world market, factor supply and other competitive advantages (Fig. 3). International trade liberalization will cause the prevailing development of "clean" or "dirty" production in the country depending on the demand rate for "clean" and "dirty" products in the country. Factor supply stimulates development of production, in which the excess factors are used intensively. According to the factor hypothesis, polluting production tends to be more capital-intensive and to move to countries with more capital (mainly developed). However, besides factor supply, there are other competitive advantages, such as lower environmental regulations. According to the pollution haven hypothesis, "dirty" production moves to countries with less stringent environmental regulations (mainly developing countries). Which of the two effects prevails remains unclear. It is important to note that overall pollution usually decreases if "dirty" production moves to developed countries due to higher environmental standards in these countries and more eco-friendly technology.

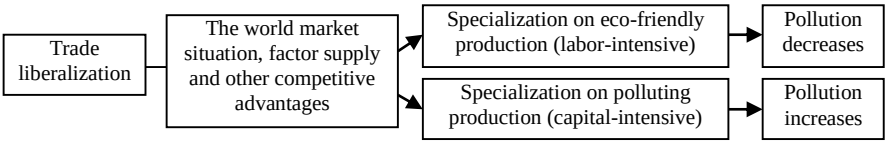

Figure 3. The impact of trade liberalization on pollution depending on the situation on the world market, factor supply and other competitive advantages

Trade liberalization has a direct impact on the number and distance of transportation and thus increases exhaust gases emission and the risk of accidents during the transportation of dangerous goods.

Some consequences of the world trade liberalization definitely increase pollution, others - decrease, but many of them can affect pollution in different ways depending on other factors. Not all ways of trade liberalization influence on the environment are equally important. Some of them may be crucial in determining the overall positive or negative impact on the environment.

YOUTH AGRISOCIO ENTREPRENEUR. YOUTH COMMUNITY REAL ACTION BASE ON VILLAGE CONCEPT PROJECT

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Agricultural in most developing countries is prospective sector to be developed. 2 aspects needed to increase agricultural productivity, first is technology and second is effectiveness of distribution system from farmers to final Consumer. There are a lot of Problems those face either farmers and consumers nowadays. Problems such as low edit value, low productivity, bad packaging, fluctuate price, etc. One of the best solution to solve this problems is by Youth AgriSocio Entrepreneur (YAE). YAE is a community that associate young generation to contribute to Social Activities related to the agriculture sector. There are two main objects of YAE program, first is to facilitate students in agricultural and related sector to contribute to the Society in Agricultural Sector, second is to increase villagers welfare. The uniqueness of this program is local branding. Each team should purposed one proposal for empowering one Village with special local branding. The initiator of this great community is me, so first, I empower villagers in Benteng Village, Ciampea, Bogor, Indonesia. My program is making "Indorempah", organic fresh drink product contain of 9 spices (ginger, cumin, cloves, Balinese pepper, palm sugar, sugar cane, black pepper, cinnamon, and anise). "Indorempah" is an example of local branding that made from empowering farmers to plant organic ingredients, and empowering housewife by make products. The development of "Indorempah" will be improved by internship program with Singapore International Foundation and Mckinsey Company. Youth AgriSocio Entrepreneur will increase and become big community because we accept 2 proposals every 3 months from Bogor Agricultural University, other universities in Indonesia, and in the future for other universities in the world. This community will be funding by multi national companies and also donators, the bargaining of funding still in the progress, and optimistic increase every year, because now people aware to the social business.

Why we create Youth AgriSocio Entrepreneur Community? Because they need us, and we are the change maker!

Examples of local branding:

Indo Rempah Nusantara

Indonesian Organic Fresh Drink

Warm the body with abundance of benefits

Uses and Benefit :

Increase stamina, blood circulation, enhance the immune system, warm the body, anti-inflammatory, appetite enhancer, relieve aches, strengthen the liver function, increase production of normal lymph, regenerate damaged cells, prevent premature aging, anesthetic, relieve sore throat, relieve muscle pain,

Treating various diseases such as:

Stomach cramps, vomiting, flatulence, colic, dysentery, diarrhea, headache, toothache, cough, fever, asthma, influenza, neurastenia, low blood pressure, impaired digestion, arthritis, weak body, Stroke, low back pain, stomach cramps, vitiligo, and hypertention.

Manufactured by :

This product is sampling that created from Villagers fom Benteng Village, Ciampea, Bogor, Indonesia. The villagers received mentoring and training by Alfi Irfan and Rasyeed Hussen

"With this programs we will empower at least 25 farmers and 25 housewifes in Benteng Village, Bogor, Indonesia"

"Sampling for Young Social Entrepreneur Program by Singapore International Foundation"

ECOLOGY AND ENVIRONMENT

Salohiddin Ismoilov
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In introduction I want mention a briefly about ecology, then I will mention some problems and solution. Ecology is the study of the ways in which organisms (plants and animals) depend upon each other and upon their surroundings. Each organism requires conditions in order to be able to live and breed. These conditions are its environment by changing the ecological conditions.

So, pollution is one of the most burning problems of nowadays. Now millions of chimneys, cars, buses, trucks all over the world exhaust fumes and harmful substances into the atmosphere. These poisoned substances pollute everything: air, land, water, birds and animals people. So, it is usually hard to breathe in the large cities where there are lots plants. Everything there is covered with soot and dirt. All these affect harmfully.

Water pollution is very serious, too. Ugly rivers of dirty water polluted with factory waste, poisoned fish are all-round us. And polluted air and poisoned water lead to the end of the civilization. So, nowadays a lot of dead lands and lifeless areas have appeared. Because our actions and dealings can turn the land to a desert.

We are to stop pollution. So, we can grow plants and trees, to purify waste, to start urgent campaigns in order to preserve environment. Also we need establish more and more organizations about protecting our green planets, organization like Green Peace, Rainbow. Ecology Protection and other. We need also advance technology for example some nanotechnology to protect from Petrol plant, Metal factory, Iron. Gas. Which producing harmful substances. One of the good point for protection ecology is "Friends of the Earth" (FoE) is one of the British pressure groups with an international reputation. Its general aim is to conserve the planet's resources and reduce pollution. FoE was established in 1971 and now it operated in 44 countries worldwide. It campaigns among other things, for recycling and renewable energy, and the destruction of wildlife and habitat. The main campaigning issues of the FoE are:

1) The protection of all animals and plants in danger of extinction.
2) An end to the destruction of wildlife and habitats.
3) A program of energy conservation measures, etc.
4) So, a number of campaigns resulted in:
5) The ban or other hunting in England and Wales
6) And indefinite delay in the construction of the Commercial East Breeder Reactor, etc.
7) But not only great groups can influence the problem of pollution. So, different people have their own opinions on this problem:

8) The continued pollution of the earth, if unchecked, well eventually destroys the fitness of this planet as a place for human life. (B. Commoner).

9) The Earth has enough for every man's need, but not for man's greed. (Ganlui).

But the problem ahead lie not so much in what we use but in what we waste. What faces us is not so much a recourse crisis as a pollution crisis. The only solution is to try to change the areas of consumption, technology and population. Changes in technology must be baked by slower population growth. And it can be achieved by education in health and women's rights. And there is a little hope of reducing consumption over the next half century.

THE USING OF ENERGY SAVING TECHNOLOGIES IN GROWING CROPS

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The author considers the process of growing crops as a complex of interrelated technological operations performed in a specific sequence using a system of machines according to parameters of influence on the land properties with the using workforce, working capital (seeds, gasoline, diesel fuel, electricity, mineral and organic fertilizers, pesticides) for crop production.

The production process combines three components: 1) production operations; 2) materials and technical equipment for the production operations' implementation; 3) quantitative and qualitative parameters for the production operations' implementation.

Technological operations are completed parts of the production process, including: 1) basic soil tillage; 2) presowing tillage and sowing; 3) crops caring; 4) harvesting.

Technological operations are interdependent, as none of them could be executed before the previous one. The quality of production operations depends on the skill level of employees, production planning, it organizing, the level of labor discipline, it motivation, accounting and control.

The most active part of the production process is the labor assets, which directly affect the economic and energy efficiency of growing crops. Changing technology is due to the corresponding change of the complex interconnected operations with more efficient systems of machines (new designs of machines and tools).

Technological parameters are quantitative and qualitative implementation indicators of technological operations by the machines and tools system.

Technological parameters of growing crops are influenced by natural (photosynthetic solar radiation level, temperature, rainfall, soil fertility) and artificial factors (machines system, hybrids, sowing, sowing terms, timing and methods of harvesting).

The author considers energy saving technologies in growing crops as a complex of interrelated operations that provide minimum energy cost per unit of production at the highest output:

$$ÅM_i = \frac{E_{C_i}}{Ó_i} \Rightarrow \min,\ Y_i \Rightarrow \max, \quad (1)$$

where EM_i – the energy intensity of growing i^{th} crop technology, MJ / ctr;

E_{Ci} – total costs of energy resources using per 1 ha of the i^{th} crop sowing, MJ;

Y_i – the yield of the i^{th} crop, ctr / ha.

The following tasks could be solved during the energy efficient technologies using in growing crops:

1) the reducing of total costs of energy resources using per unit of cultivated area at a constant i^{th} crop yield:

$$E_{C_i} \Rightarrow \min,\ Y_i = Y_{\alpha i}, \quad (2)$$

where E_{Ci} – total costs of energy resources using per 1 ha of the i^{th} crop sowing, MJ / ha;

Y_i – the yield of the i^{th} crop, ctr / ha;

$Y_{\alpha i}$ – the i^{th} crop yield at the lowest costs of total energy using, ctr / ha;

2) the i^{th} crop yield increasing at the same total energy costs per unit of cultivated area:

$$E_{c_i} = E_{\alpha_i},\ Ó_i \Rightarrow \max, \quad (3)$$

where E_{Ci} – total costs of energy resources using per 1 ha of the i^{th} crop sowing, MJ / ha;

$E_{\alpha i}$ – total costs of energy resources using per 1 ha of the i^{th} crop sowing at the yield level increasing, MJ / ha;

Y_i – the yield of the i^{th} crop, ctr / ha;

3) the i^{th} crop yield increasing during the reducing of total energy costs per unit of cultivated area:

$$E_{C_i} \Rightarrow \min, \acute{O}_i \Rightarrow \max, \quad (4)$$

where E_{C_i} – total costs of energy resources using per 1 ha of the i^{th} crop sowing, MJ / ha;

Y_i – the yield of the i^{th} crop, ctr / ha.

As follows, the energy intensity of growing crops technology depends on the number and nature of production operations. The energy accumulated in the yield increases faster than energy costs with the using of advanced technological processes. However economic and energy efficiency of crop production increases with the technologies improvement and the implementation of energy efficient machines system (new designs of machines and tools).

ECOLOGICAL-ECONOMIC ASPECTS OF WASTE MANAGEMENT

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One of the hottest environmental issues has recently become the fight against the rubbish. Both air pollution, depletion of the ozone layer and global warming are the result of human activity.

Ukraine is taking the lead position of wasting products per person in Europe. There are more than 4.7 thousand official landfills, which are filled up with 35 billion tons of all kinds of waste. Three percent of the country is covered by domestic and industrial waste. This may become an especially acute problem soon.

The only way to ensure environmental security and development of human consciousness is the use of energy saving technologies. This campaign is based on the economy of resources, maximizing the use of secondary resources, comprehensive utilization and waste management.

The main step is the separate rubbish collection such as paper, glass, food, plastic and metal bottles. Unfortunately, in Ukraine there is no culture of waste separation, all waste is thrown into the same container. In order to change this sad situation we have to study the world experience in dealing with waste management.

Waste separation is necessary for the rapid selection of raw materials for recycling, less pollution, saving money instead of building specialized separation factories. Germany is one of the advanced European countries in solving rubbish problems. German garbage sorting is a system with a lot of particularities. Thus there are containers for different types of waste near the house. Blue container is

used for paper and cardboard, but packets of juice and dirty wall paper you cannot throw out there. There are special containers for glass divided according to the color brown, white or green. Moreover the most conscientious Germans unstick label from the bottles. Besides, you cannot throw away bottles at night and on weekends as the noise of breaking glass can disturb citizens. Plastic bags, foil, cans are thrown out in yellow container. What is more packages should be dry, empty and put together. Brown container is used for organic waste. Preventing the decay and spread of smell, Germans recommend wrapping waste in old newspaper. So, before you decide to throw away anything in Germany you should think "what kind of litter bin do you need ?"

There are many opinions about the most efficient processing waste technology. The most common method is incineration. In the EU, the U.S. and Japan observed increasing the number of incineration plants with generation of electricity or thermal energy using alternative fuels. Plants must be equipped with a powerful gas treatment system, preventing air pollution. At the end of 2011 sixty one incineration plants worked in Germany with a total capacity of 14 million tons per year, 72% of produced energy is used to generate heat (13,609 GW/h), 28% - for electricity (5257 GW / h). Incineration of solid wastes generate electric power that is 0.6 of the total electricity in the country.

In Sweden, the recycling sector provides 20% of the total heat. Moreover, 96% of waste recycled by 30 plants and 800 tons are imported. Swedish businessmen want to increase this number in half. Nowadays in Ukraine there is no business like in Sweden. There are only two incinerators in particular "Energy", loaded half and plant in Dnepropetrovsk, which unfortunately doesn't work. Besides biological waste processing is actual at this time The result of it are biofuel and compost.

In Japan only 12% of household garbage is recycled. Waste is used to produce eco cement to make connection blocks to strengthen the coasts. The demand for this product is 6 million tons per year.

In the U.S. used special equipment which chop food waste under the sink in the kitchen. This products fall into the domestic waste water and then removed.

In Germany used sieve catching the domestic refuse. Accumulated waste is processed by biogas equipment and after that produce biogas, which is used to heat water and produce electrical energy. Thus districts provide themselves with electricity.

Table 1 – The level of consumption of municipal waste in the EU (%, 2009).

Country	Recycling	Incineration	Composting	Landfilling
Germany	48	34	14	0
Sweden	36	49	14	1
Switzerland	34	49	17	0
France	18	34	16	32
Bulgaria	0	0	0	100
Ireland	32	39	4	62
Netherlands	32	39	28	1
Ukraine	34	0,17	0	65,83

Analyzed statistical data, was found that the highest rates of ecological and economic ways of processing solid waste have developed European countries. The leader in recycling is Germany - 48%. The biggest amount of waste is burned in Sweden and Switzerland - 49%. In Ukraine 34% - is recycled, 0.17% - is burned and 65.83% - is landfilled .

As we already know landfilling takes the first place in Ukrainian waste management. This is obvious because one ton of garbage incineration costs 127 UAH and the same amount of garbage landfilling costs 90 UAH. Income from the removal of one ton of garbage is 250 UAH. So, it is cheaper to take garbage to the landfill, but in Europe this method is the most expensive because of special environmental requirements and equipment.

Art of clever waste management is a task of everyday life that will solve environmental problems, keep resources such as gas, electricity and save the nature for our descendants.

ECOLOGY

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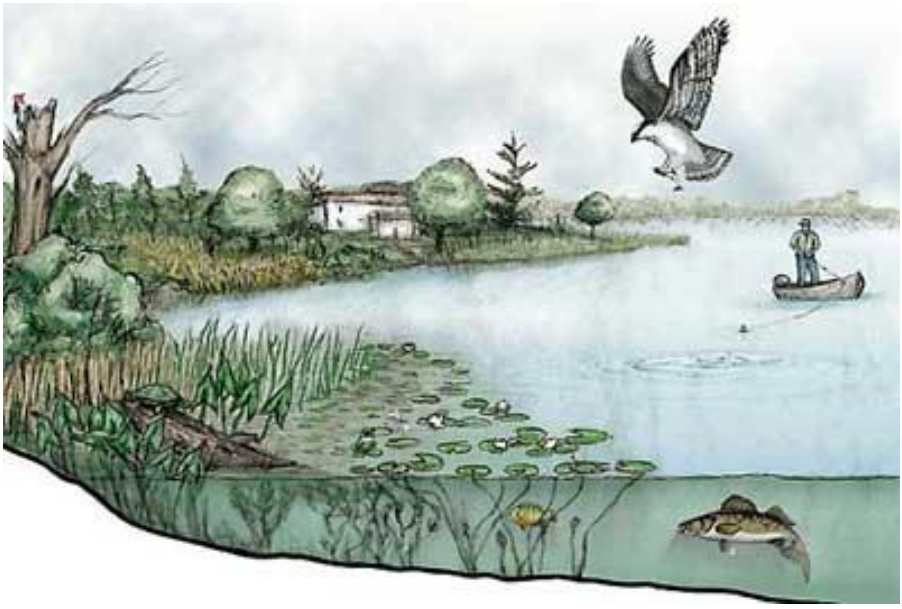
Tajikistan

Ecology is the study of interaction of living organisms in the environment. However the modern meaning of the concept of ecology has a wider meaning than in the early decades of the development of this science. Currently, most often under the mistaken environmental issues are understood, above all, the protection of the environment. In many ways, this shift is due to sense more tangible consequences of human impact on the environment. Nevertheless necessary to separate the concept of ecological relating to the science of ecology and environmental relating to the environment. The main concept in ecology is down to ecosystem.

Ecosystem is a complex set of relationships among the living resources, habitats, and residents of an area. It includes plants, trees, animal, fish, birds, microorganisms, water and people. Ecosystems will fail if they do not remain in balance. Food and territory are often balanced by natural phenomena such as fire, disease, and the number of predators. Each organism has its own niche, or role, to play. As you can see in this photo these plants and animals depend on each other to survive.



ORGANIC AGRICULTURE: ESSENCE, PRINCIPLES AND BENEFITS

I.I. Koblianska *supervisor (Ukraine)*
Ikeanumba Chichi Favour *(Nigeria),* ***Igwegbe Uzodinma*** *(Nigeria)*
Sumy National Agrarian University, Sumy, Ukraine

Organic agriculture is aimed to provide agricultural products, especially food, which is safe for the health of producers and consumers and does not damage the environment. Thus a healthy lifestyle has been institutionalized internationally, which requires the assurance that agricultural products should be safe to eat

beratribut (food safety attributes), high nutrient content (nutritional attributes) and environmentally friendly (eco-labeling attributes).

The basic rules of organic production are that natural inputs are approved and synthetic inputs are prohibited. But there are exceptions in both cases. Certain natural inputs determined by the various certification programmes to be harmful to human health or the environment are prohibited (e.g. arsenic). As well, certain synthetic inputs determined to be essential and consistent with organic farming philosophy, are allowed (e.g. insect pheromones). Lists of specific approved synthetic inputs and prohibited natural inputs are maintained by all certification programmes. Many certification programmes require additional environmental protection measures in addition to these two requirements. While many farmers in the developing world do not use synthetic inputs, this alone is not sufficient to classify their operations as organic.

Organic agriculture promotes and enhances the agro-ecosystem by encouraging biological cycles and soil biological activity. It emphasizes the use of sustainable, responsible management practices in the use of farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by the use of organic agronomic, biological and mechanical methods of production, processing and post harvest handling, as opposed to the use of synthetic materials, to fulfill any specific function within the system. There are the roots from which organic agriculture grows and develops. They express the contribution that organic agriculture can make to the world, and a vision to improve all agriculture in a global context.

Agriculture is one of humankind's most basic activities because all people need to nourish themselves daily. History, culture and community values are embedded in agriculture.

The principles of organic agriculture serve to inspire the organic movement in its full diversity. Furthermore, they are presented with a vision of their world-wide adoption.

Organic agriculture is based on:

- the principle of health;
- the principle of ecology;
- the principle of fairness;
- the principle of care.

The principles are to be used as a whole. They are composed as ethical principles to inspire action.

- Organic agriculture benefits include social, environmental and economic benefits.
- There are such social results of organic agriculture:
- organic agriculture offers a range of health benefits for consumers who eat organic fruits and vegetables;
- farmers health benefits;

- health benefits for the farm workers who handle the produce etc.

Organic agriculture provides environment, and/or animal welfare. Organic agriculture provides an alternative to the destructive environmental consequences of the chemical fertilizers and pesticides used by conventional farmers. Organic agriculture uses pest control methods that foster a healthy ecosystem, such as introducing beneficial insects or choosing companion plants that attract natural predators. These strategies benefit the environment by creating balance and promoting species diversity.

Organic farming also uses much less energy than conventional agriculture, mostly because it doesn't use nitrogen fertilize, agriculture was organic because modern technologies for artificially increasing yields and controlling pests had not yet been invented.

Organic agriculture allows small-scale farms to be more competitive by striving for quality rather than quantity and selling to consumers directly at venues such as farmers' markets

In conclusion, organic agriculture is the important element of world's sustainable development strategy. It contributes to the overall goals of sustainability:

- organic farming does not use genetically modified organisms or transgenic organisms and for this reasons it helps in safety of environmental, health and social;
- organic agriculture have helped to provide market opportunities for farmers by using local resources;
- market for organic products has high potential and offers opportunities for increasing farmers income and improving their livelihood.

Organic farmers have economic benefits due to high quality of products. Organic products as the part of healthy lifestyle become more popular all over the world. That's why the most simple expression of organic farming essence is "no chemical pesticides + no chemical fertilizers +certification = premium price".

FEATURES OF CONDUCTING THE DECOUPLING-ANALYSIS

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At the present stage of development the issues of economic growth for any country becomes important. However, intensive economic growth leads to an exacerbation of a number of problems such as unbalanced exploitation of natural resources, decrease of quality of environment, increase of the costs of natural balance reproduction and so on. Therefore, in view of these problems, it is

extremely important to disclose the essence of decoupling effect as an economic phenomenon that reflects the ability of an economy to grow without increasing pressure on the environment.

The phenomenon of the gap between economic growth and the reduction of anthropogenic pressure on the environment called "decoupling". Definition of "decoupling" reveals the phenomenon of "polar" development (opposite development direction) of two or more objects of any system. In ecological and economic sphere decoupling characterizes differentiation (dependence leveling) between economic growth and pressure on the environment. Decoupling phenomenon appears in reduced growth rates for pressure on the environment compared to the growth rates of economic development over the same period. That means that growth will be achieved at the expense of the amounts of natural resources of the ecosystem with which anthropogenic pressure does not exceed its assimilative capacity [2].

The level and dynamics of macroeconomic indicators of socio-economic subsystem has a close relationship with the level and rate of assimilative potential consumption for environmental subsystem of the national economy. This relationship is revealed by decoupling factor indicator. In fact, this figure shows the ratio between the growth in mass of pollutions and gross domestic product (GDP) (Formula 1) [1]:

$$F = 1 - \frac{EP_e}{DF_e} / \frac{EP_b}{DF_b} \quad (1)$$

Where DF_e, DF_b – indicators of economic growth (are determined by macro-indicators of GDP, National Income etc.) in the final and base year respectively, UAH; EP_e, EP_e – anthropogenic pressure on environment (determined by the harmful pollution indicators), physical units.

Simple mathematical manipulations let represent formula (1) as follows:

$$F = 1 - \frac{EP_e}{EP_b} / \frac{DF_e}{DF_b} \quad (2)$$

Where $\frac{DF_e}{DF_b}$ and $\frac{EP_e}{EP_b}$ – are the indicators of growth rate of economic development and pressure on the environment respectively, coefficient.

When F > 0 and this index in its dynamics increases the decoupling phenomenon is observed - anthropogenic pressure on the environment is reduced with economic growth. When F < 0 and decreases in dynamics - economic growth leads to significant pressure on the environment. In the case of F = 0, a definite conclusion cannot be done: if the rate of economic growth and pressures are of 100% anthropogenic pressure on the environment will not grow and not decrease over time, in case of equity growth pressures and economic growth (over 100%),

pressure on the environment will be the growing, if the decline rates are the same for economic development and anthropogenic pressures (less than 100%) pressure on the environment decrease over time.

So decoupling reflects the ability of the state economy to accrete the economic power without the increased pressure on the environment. In order to identify decoupling it is needed to fix the relationship between indicators of economic driving forces (mostly common GDP), which is traditionally considered to measure quality of life, and an indicator of pressure on the environment. The issue, therefore, is determining the rate of growth of macroeconomic indicators relative to the amount of pollutants emissions that may signal according to national governments about the need to reduce the environmental impact of the creation of each additional unit of material well-being of citizens.

There are five main objectives of the decoupling strategy: reduction of pollution factors action, production efficiency increase, consumption efficiency improvement, changes in the share of costs in favor of the least resource demanding, improving quality of life level [1].

Given the mentioned above, it can be stated that a key task of the Ukrainian economy development is to create a style of management, which should provide savings of natural resources and reduce the anthropogenic impact on the environment at high rates of economic development.

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ECONOMIC MECHANISMS ACHIEVING SUSTAINABLE DEVELOPMENT

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No doubt human welfare dependence of the transition to sustainable development. The dramatic worsening in the world of global environmental problems such as climate change, desertification, loss of biodiversity, leading to the realization of the need to create a new economic policy, which is reflected in

the report of the United Nations' Millennium Development Goals. One of the main purposes of such - "Ensure environmental sustainability".

Promising indicators of progress in environmental sustainability for Russia now offered the following indicators:

- Undisturbed business activity area;
- Refresh rate of fixed assets,
- The number of people using drinking water that does not meet hygienic standards.

If the indicators related to protected areas, a relatively prosperous Russia (46.6% of the forest cover and 13% of the area, protected areas), and in the provision of clean drinking water, there has been progress, the rate of replacement of fixed assets remains low. In the Russian capital stock actually worn out by more than half, though prevalent in the Russian economy - energy and mining production, which has a significant impact on the environment.

The rapid spread of the best available technologies is important for Russia as well as in the near future will be updated physically and morally outdated equipment. In the forthcoming modernization is important to create the conditions for the transition to sustainable development based on the best available technology, which is recognized in the international community.

Meanwhile, statistics show that the bulk of the funds allocated for environmental protection in the Russian Federation - is own funds. In this regard, timely and relevant is the development of economic instruments to achieve sustainable development, one of which is leasing.

Instrument of lease financing is a significant contributor to economic development through the creation of new eco-efficient integrated technologies. A transition to the best available technology is a prerequisite for sustainable development. However, today in Russia the use of such economic mechanisms such as leasing in addressing the renewal of fixed assets based on the best available technology, is difficult for several reasons:

- Inadequate legal and regulatory issues of leasing. Reflected in the lack of a modern, responsible global trends legislation. As a result, the conditions of abuse of conscientious lessee.

- Differences in the approach to financial reporting under Russian accounting standards and International standards of financial reporting. This, above all, the differences on the classification of the transaction in the form of leasing, the recognition of the object of leasing, lease payments reflected in the financial statements. Although at present the Russian attempt to improve regulatory leasing, particularly in the areas of transactions in the accounting and reporting, though the changes are not included in the basic legislative acts.

One of the mechanisms used abroad cover the damage to the environment is an environmental insurance. Environmental insurance is a market mechanism for environmental management, aimed at the prevention and remedying of

environmental damage and its components. In economic terms, environmental insurance in Russia is a huge public interest, as at present the company is not responsible in full for the damage caused to the environment, and this compensates for the damage state, which is fully applicable to the bankrupt mining companies. Insurance is a classic off-budget sources of environmental management.

Insurance experience especially dangerous objects within the Federal Law "On obligatory ecological insurance" has shown that in practice, compensation for environmental risks is a last resort and as a residual. Meanwhile, experimental calculations have shown that the system of environmental risk insurance can compensate for up to 40% of the losses caused by maintaining a sufficiently high financial stability of insurance operations.

At present, Russia is secured less than 10% of the potential risks (against 90-95% in most developed countries). The entire volume of insurance premiums in the country on par with those of only one Western insurance companies, closing the list of one hundred of the largest insurance companies in the world. Variety of insurance products in the Russian market is much lower than abroad.

Thus, we can draw the following conclusions. Target setting of the President and the Government to improve the environmental efficiency of the Russian economy has a limited amount of funding. Therefore updated task of stimulating economic agents to invest in integrated environmental technologies, particularly in the form of leasing. Inconsistency Russian legislation regulating leasing had a number of negative effects: the abuse of the process of formation of the tax base for corporate income tax, impairment of the interests of good lessee, etc. In addition, a number of IFRS are an advantage for Western companies than domestic ones, and for example, a number of European countries (Germany, Netherlands, Belgium) today are leading on the implementation of integrated environmental technologies through leasing arrangements. On the other hand obvious need to address issues of development of environmental insurance. The ability to create such a system, clearly illustrated by the establishment of a system of liability insurance companies operating hazardous production facilities, supervised Rostechnadzor allowed three years to provide insurance coverage to more than 30% of the main operational risks.

POTENTIALITY OF THE EASTERN SIVASH'S AQUATIC LIVING RESOURCES USE

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It was declared by Convention of Biological Diversity (Rio-de-Janeiro, 1992), that its conservation and sustainable use is the common problem of all mankind. Due to their considerable productivity wetlands are able to maintain biotic diversity at the highest level.

Ukraine became the successor of the Ramsar Convention in 1996. Since that time network of wetlands having international status, has had 33 sites with the total area of 676,251 ha. One of the most valuable wetlands located in the Western Pryazovya is the Eastern Sivash. It is the part of the shallow, lagoon-like bay on the west of the Sea of Azov, in the south of Ukraine. The Eastern Sivash has an area of about 1,650 km^2. Its considerable ecological role is determined by the unique ecological and geographical conditions, a large landscape and biological diversity. In addition to an ecological role wetlands also have social, cultural and economic significance, as they can be seen as the waters in which sport and industrial extraction of aquatic living resources is possible.

One of aquatic living resources most promising for extraction in the waters of the Eastern Sivash is a mosquito grub – larvae of several species of mosquitoes families Chironomidae Jacobs, 1900, and gammarus – small crustaceans, amphipods from the family Gammaridae Leach, 1814. Mosquito grub is widely used in aquarium keeping industry as live feed. Moreover, it is a valuable fishing bait. The most commonly used in feeding aquarium fish are maggots of widespread chironomids *Chironomus plumosus* (Linnaeus, 1758). They are of dark ruby color, reaching the length of 20 mm. Chironomids represent the benthic fauna as they live at the bottom of reservoirs in the muddy substrate and feed on demersal organics. Among gammarus of this region typical are species of *Gammarus aequiqauda* (Martinov, 1931) and *Gammarus subtypicus* (Stock, 1966). Gammarus is popular and indispensably used as a feed in fish factories, and is widely used in growing trout, sturgeon, carp and other valuable fish species. In aquarium industry it is used for feeding medium and large fish, as well as a good food that helps cleanse fish's digestive system. It can also be eaten by aquatic turtles.

Taking into account widespread dissemination of biological species within the waters of the Eastern Sivash and considerable market demand for them, the objective of this research is to determine the potential stocks of these aquatic living resources and formulate principles of their sustainable use.

The basis of the research material is macrozoobenthos samples selected on the stations of Eastern Sivash according to the standard hydrobiological methods in 2004 and 2010-2011.

On average during 2010-2011 chironomid's mass ranged from 0.04 to 7.1 g/m^2 with an average value for the period 1.3 g/m^2. In terms of total area waters moth stocks on average amounted to 2145 tons. In the 2003-2004 observation average biomass of this species was slightly higher – 1.47 g/m^2 (or 2425.5 tonnes from all reservoirs) with fluctuations in the range 0,05 – 12 g/m^2. Gammarus' biomass in 2003-2004 had values lower than in 2010-2011. In average it stood at 4.42 g/m^2 in 2010-2011, at a value of 4.05 g/m^2 in 2003-2004. Thus, during the years 2003-2004 and 2010-2011, gammarus' biomass stocks of the entire water area equaled 7,293 tons and 6,683 tons respectively.

It should be noted that nowadays in epy Eastern Sivash there are no official businesses using this resource. However, there are cases of illegal mining and subsequent sale of these species. This situation makes it impossible to control the use of resources and in the future may lead to adverse changes in the benthic communities of the region.

For providing sustainable use of aquatic resources in the investigated area strict compliance with the rules of their extraction and protection is required. Thus, according to the rules of amateur and sports fishing, extraction of mosquito grub is permitted by one hand dredge with a diameter of 70 cm without any mechanical devices, and extraction of gammarus can be done by one fishing net with a diameter of 70 cm. Extraction of mosquito grub and gammarus is free of charge at water areas of general use, at special sites allowed by fish protection bodies for use as a bait for fishing or for aquarium keeping industry needs in the amount not exceeding 0.1 kg for a person per day.

The development of the Sivash's region should undoubtedly be based on the concept of sustainable development. The main idea of this concept is that issues relating to the economic and social development of the region and issues relating to the preservation of high quality environment in this region should be considered together. Regional development plans should take into consideration economic, social and ecological aspects of the development and try to balance all these three components in order to promote the harmonious development of the region. Moreover, it is necessary to ensure protection of the habitat of these species. One of the most effective measures is creation of protected areas and objects. In Sivash region there is Azov-Sivash National Park with the total area of 57,400 ha established in 1993. It is planned to create Sivash national park with the total area of 207,187 ha.

Summarizing it should be noted that the Eastern Sivash is a potentially important water area for aquatic invertebrates. Whereas it is necessary to develop a clear framework of their extraction, processing and sale taking into account applicable legislation of Ukraine and necessity to preserve the benthic communities

of the region. Undoubtedly, the development of the Sivash region should be based on the concept of sustainable development.

THE DPSEEA MODELS FOR SUSTAINABLE DEVELOPMENT ESTIMATION

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All main indicators of SD are associated with an objective to show the desirable direction in to move. Some of the objectives related to specific targets. Progress towards one objective may negatively influence on progress towards other. The balance between these should be received dynamically, and it may not be possible to set a specific target for each indicator.

A well-known example of a linkage-based framework model in SD is the Pressure-State-Response (PSR) which was developed by Statistics of Canada. Then the model was further improved and internationally accepted in many countries. The United Nations Commission on Sustainable Development (UNCSD) modified the PSR framework and called it Driving force-State-Response (DSR). The last has accompanied by a set of 134 Sustainable Development Indicators. The OECD has further changed the DSR framework and re-named as Driver-Pressure-State-Impact-Response (DPSIR) framework. The DPSIR framework has been used to structure the environmental information by most member states of the European Union and by many international organizations including the European Environmental Agency and EUROSTAT, the statistical office for the European Communities.

The World Health Organization took a wider look, relating impacts of macro driving forces and pressures on both health and the environment. The framework was called the Driving Force-Pressure-State-Exposure-Effect-Action (DPSEEA). The DPSEEA framework (Figure 1) is useful as it covers the full spectrum of cause and effect relationships starting from potential forces and required actions and brings together professionals, practitioners, and managers from both environmental and public health fields to help orient them in the larger scheme of the problem.

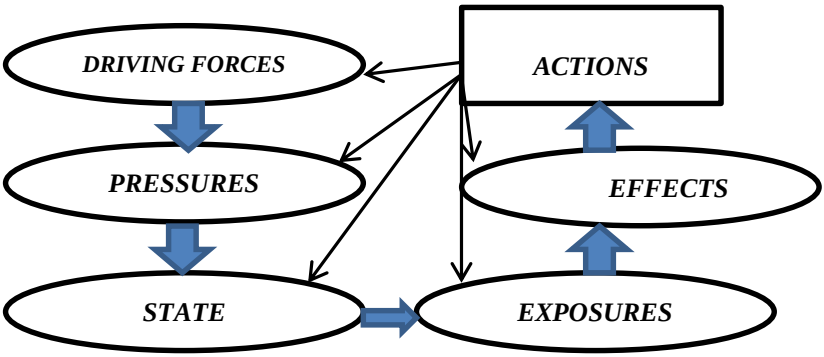

Figure 1. Modified DPSEEA Model

According to the Modified DPSEEA Model:

DRIVING FORCES are numbers of key factors on the macro level influence the environmental processes and finally are resulted human health. For example, macroeconomic policies may have major effects on the environment and on people's health.

PRESSURES. The various driving forces are resulted in form pressures on the environment: such as housing, heating, electricity production, energy, industry, recreation and so on. Many factors however, including policy context, social attitudes and economic infrastructure, affect the extent to which driving forces are translated into actual pressures on the environment. It should be underlined that pressures are generated by all sectors of economic activity.

STATE. The quality of the environment is affected by the number of pressures exerted. Some changes may be complex and interrelated, affecting almost all spheres of the environment. Those are found in such effects as air pollution, marine pollution**,** global warming, while others may be more localized (for example, contamination of a local water supply).

EXPOSURES are defined and measured, indirectly as the concentration of the pollutant in the environment (considering the duration of exposure, humans activity and initial health), as an estimate of the amount that an individual actually ingests, inhales or absorbs, or as the amount that actually reaches a target organ where a health effect may occur.

HEALTH EFFECTS. Once a person has been exposed to an environmental hazard, health effects may manifest themselves which may vary in type, intensity and magnitude depending on the type of hazard, the level of exposure and other factors.

ACTIONS. An approach to the control and prevention of health hazards which focuses on hazards of human origin is useful in that it addresses potentially remediable problems. This approach however must be adopted with due regard for

the still considerable uncertainty that exists about the extent of the direct and indirect risks to human health associated with specific agents in the environment or with the broader development process.

The DPSEEA framework has been widely used in the environmental health sector. This framework is very popular and easy in understanding beginning from drivers of environmental change (such as technology and population) to pressures (such as production, consumption and waste releases) to changes in environmental state (such as pollution levels) to exposure (such as external, internal and target organ doses) to effects on health, environment and overall sustainability. All sectors including public, private sector and individuals can take action to the outcomes at all levels, and this information can be used to provide feedback at all levels. In combination with multicriteria decision-making, this framework has a great potential to contribute significantly to sustainability analysis.

The main advantage of DPSEEA is its flexibility and applicability. Its usefulness depends on the context in which it is used, e.g., health in sustainable development planning.

MAIN ECONOMIC BENEFITS OF ECOLOGICAL MANAGEMENT

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The ecologist - economic aspect of conservation of nature began to be formed rather recently. If the purpose of economy is an improvement in conditions and standard of living, than each step of its development forms these living conditions. The person needs to learn how to forecast the future and develop the strategy of designing and creating the nature-technical environment,which is necessary for him.

Protection of the environment is a system of measures to support the rational interaction between activity of people and nature, provide preservation and restoration natural riches, rational use natural resources, warrn direct and indirect negative effect of the results caused by society's activity on the nature and health. Condition of the environment is the second for ponderability (after lifestyle) defining factor of our health. It is necessary to take into account also the damage to the nature and economy,caused by polluted environment. Citizens, housing-and-municipal, industrial and transport facilities, agricultural grounds, the woods and reservoirs become victims of pollution (recipients).

The analysis of dynamics of state of environment deterioration doesn't leave a place for doubt in need of urgent and radical measures for stabilization of indicators and then to their subsequent changing to the best. Such measures aren't

simple. They contain organizational, economic, legal, ethical, information, financial aspects. Ranks of organizational measures include improvement of management by nature protection activity, implementation of modern, highly effective ecological management. Natural resources represent not only a basis for development of processing productions, but also a guarantee of normal activity of future generations. Relevance of introduction of ecological management increases in process of industrialization of economy and exhaustion of not renewable natural resources.

Activity in the field of ecological management at the first stages of the development (prevention of impact on environment) is already capable to lead to essential economic effects due to minimize and save raw materials, energy resources; decrease losses; improve the quality of production; lessen defective goods; decrease ecological payments and penalties; increase labor productivity; reduce accidents and costs of elimination of their consequences, etc.

The main economic benefits prevention of impact on environment and ecological management are defined by various advantages and additional opportunities connected with similar activity, including :

- drawing attention of investors; appearance of the additional bases for getting advantages and privileges at investments;
- additional opportunities for impact on consumers and increasing the competitiveness of made production and services;
- opportunities for increasing the efficiency of marketing and advertizing;
- drawing attention of the international organizations and the international public to the enterprise: membership in the international ecological unions of businessmen;
- additional opportunities for development of the relations with business partners abroad; advantages of territorial and national ecological leadership;
- additional opportunities for strengthening and expansion of positions of the enterprise in the international commodity and financial markets;
- bases for increase cost of the enterprise.

The principles of a sustainable development have to join the ecological strategy of development of the enterprises and the state ecological policy on long-term prospect. In the concept of transition of Ukraine to a sustainable development, the following main criteria are defined:

1. Benefit from ecologically significant economic activity shouldn't be less than damage, which was caused by this activity.
2. Ecological expenses and benefits have to have the cost.
3. Damage to environment has to be minimum, as it is possible to be reasonably reached taking into account economic and social factors.
4 . Prevention of irreversible processes.
5 . Use of the real prices.

At the heart of ecological management have to lie also the principles of ecojustice. They have to be shown in understanding by the management of the enterprise the moral responsibility for negative impact on environment and irrational use of natural resources.

SPATIAL DATA INFRASTRUCTURE FOR ECOLOGICAL ENVIRONMENT

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The main objective is to ensure the sustainable development of Energy, requires the development of enterprise geographic information systems (GIS) for the modeling of energy systems. The corporate GIS in Ukraine will increase the energy efficiency of the management of energy companies.

In general, web-based spatial data infrastructures (SDI) such as INSPIRE consist of institutional and technical frameworks for the creation, exchange, and use of geospatial information throughout an information-sharing community. Such frameworks can be implemented narrowly to enable the sharing of geospatial information within an organization or broadly to enable the sharing of geospatial information at national, regional, or global levels. In all cases, spatial data infrastructures provide a coherently managed means for posting, discovering, evaluating, and exchanging geospatial information by participating information producers and users.

The purpose of INSPIRE is to tie European geospatial information producers and users together in a single, geospatial information-sharing network to improve decision making and operations in service of a productive and sustainable Europe. The target users of INSPIRE include European Community policy makers, planners, and managers and their organizations along with commercial businesses and the general European public.

Smart grid technology will communicate with consumers and consumer devices and make alterations to help lower costs, improve equipment utilization, and reduce carbon emissions. To do this, utilities should fully integrate GIS into the overall IT framework.

Overall, GIS offers the following advantages:

- publish fast, intuitive web maps tailored to any audience, dramatically strengthening business and resource decisions with real-time geointelligence. ArcGIS Web Mapping APIs complement this technology and support the development of web map-based applications consuming ArcGIS for Server services;

- geographically enable IT investments, shrinking data and application redundancy, optimizing system configurations, and consolidating enterprise systems;

- centrally manage geodata, providing better data security and integrity for an organization's most important information assets;

- simplify access to large volumes of imagery resources, significantly reducing storage costs and data processing overhead;

- extend GIS to the mobile workforce, increasing the accuracy and value of field data collection projects and asset monitoring as well as resource and event.

THE RELATIONSHIP BETWEEN HUMAN AND ECOLOGICAL HEALTH

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Ecology is, in the most general terms, the study of the interrelationships between organisms and their environment. There are many branches of ecological study, but the basic definition of ecology emphasizes that all organisms and their environment are interrelated. Organisms are affected by their environment, the environment is affected by organisms, and both directly and indirectly organisms are affected by other organisms. Some organisms affect their environment passively, for example a tree provides shade and transpires water through its leaves which have a moderating effect on temperature and humidity. Other organisms modify their environment actively, like the groundhog who moderates the temperature and humidity of its environment by burrowing underground. Humans are organisms who have developed tools to change their environment in very profound ways, which has allowed us to colonize and even prosper under a very wide range of environmental conditions. But humans, like all other organisms, are also directly and profoundly affected by the natural environment in which we live.

Human ecology may study the social reason for our smoking habit. It may also study the reason that society has allowed known carcinogens such as lead, to remain in our environment. In studying the social interaction between humans and their environment, human ecologists are able to find solutions to problems that are caused as a direct result of interaction between humans and their environment. Biology ecology may study biological factors in the human body that are out of our control. By studying the relationship between humans and their bodies, ecologists can sometimes find links in other types of ecology and find ways to produce a positive outcome.

Human health depends on many ecological factors. In many cases, humans have the ability to effect those factors. Humans can usually change their

environmental factors through geography or through direct environmental contact. While we can not always change our biology, we can change environmental factors that will effect our biology. Humans have the ability to change many factors that effect us both directly and indirectly.

Finally, good human health requires plenty of regular physical exercise in an attractive and relaxing environment.

THE MECHANISMS OF SUSTAINABLE DEVELOPMENT ACHIEVEMENT IN DAGESTAN

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The concept of ecological security in Dagestan, as well as for the whole of Russia and the world, must be based on the preservation of the biosphere and its stability, not primarily technological solution to this problem. Ensuring the safety of the social environment requires adherence to the laws of interaction of the biota and the environment, which act in the biosphere from its inception billions of years and acted during the whole process of evolution.

Thus, the question is about the adaptive strategies of society in relation to the biota and the biosphere as a whole, rather than the biosphere transformation to the technosphere or the noosphere.

Sustainable development model connects in a single socio-natural system environmental, economic and other social processes, without considering as a priority in their purely economic parameters, as was done before. This is a systematic approach to understanding the development strategy, and it requires for its understanding of major changes outlook.

Revival of Dagestan, its inclusion in the global and Russian civilization process, which is guided by a model of sustainable development must be linked to the implementation of a new type of propulsion, when necessities of the present generation will not be achieved at the expense of our children.

In all human activity the main principle should be the gradual reduction of human pressure on the environment.

There are the main requirements for the formation of such environmental system:

1) the development of environmental justice market, and not just the free market (as the latter was formed at the expense of the destruction of nature);

2) the decreasing the disparities in standards of living in different regions of the Republic of Dagestan, the eradication of poverty and misery, the formation of socially fair society, promote economic order and change the geopolitical

relationships in favor of partnership and peaceful relations, without which the transition to a sustainable development model cannot be realized;

3) the rational using of resources, which is essential for sustainable economic (and also environmental) development, compliance with the standards extraction of non-renewable resources;

4) the significant increasing environmental costs of the national, regional and international financial assets;

5) forming the methodology and pricing strategy that reflects the cost of cleaner production and other sectors of activity, as well as taxes, benefits, penalties, environmental certification of products, licensing of business, environmental, insurance, etc.;

6) saving criteria of efficiency in green markets, but not in the sense of commitment to the highest, but to optimum efficiency – achieving results in the minimum cost and without degradation of the environment, according to ensuring environmental safety;

7) creating economic incentives and mechanisms to stimulate the production and consumption environmentally friendly products, the wide implementation of economic projects that provide not only the necessary products, but also improve the resilience of the biosphere and preserving biodiversity;

8) a comprehensive environmental assessment of all types of business and economic decisions authorities and creating a new legal framework - environmental standards for industry, agriculture, transport, etc.;

9) purposeful formation of new types of businesses – environmental, that can engage environmental issues along with government and community efforts, in the implementation of measures for the transition to a sustainable development model.

In developing the program of ecological safety of Dagestan, the following areas should be priority:

1) the reliable estimating of the primary bio-products by region and country as a whole;

2) the organization to monitor chemical cycles with the release of natural and human factors;

3) the biological and ecological capacity evaluation;

4) developing a strategy to bring the population in line with the capacity of the country.

The main reason of environmental education should be regarded as the world has recognized the human right to a healthy living environment.

Environmental education in the context of sustainable development gets the status of backbone factor of education, defines its strategic goal and leading direction.

Conclusion is evident: to solve the environmental problem to change a person's culture, science and education. All this, of course, do not guarantee, but it

creates significant conditions and opportunities for the formation of the new man - the environmental man.

The most optimal solution to the problem of environmental management can be found at the junctions of different approaches, different scientific fields of research methods, which form the basis of the proposed solution concepts of social and environmental problems of the country.

INTEGRATED WATER RESOURCES MANAGEMENT: RESTORATION OF WATER QUALITY IN WATER RESOURCES FROM DEVELOPING COUNTRIES

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Water is most essential but scarce resource in developing countries. Presently the quality & the availability of the fresh water resources is the most pressing of the many environmental challenges on the national horizon. The stress on water resources is from multiple sources and the impacts can take diverse forms. Geometric increase in population coupled with rapid urbanization, industrialization and agricultural development has resulted in high impact on quality and quantity of water in developing countries. The situation warrants immediate redressal through radically improved water resource and water quality management strategies.

Reuse/recycling of treated domestic sewage:

 Cities/towns discharging wastewater should treat the wastewater suitably for land application and dispose of such water on land to the maximum extent possible. In cases where wastewater is to be discharged into a water body, the degree of treatment will have to be higher, keeping in view the low quantity of available water for dilution and abstraction points downstream, etc.

 If the city does not have adequate land for irrigation due to increased urbanization, the neighboring states may be approached. The fresh water so saved from irrigation could be utilized for meeting the drinking water requirements or for ensuring minimum flow in river.

 It is felt that the dilution of effluents is not a practical and economically viable solution to the problem that domestic and industrial effluents be adequately treated for re-use, for irrigation, industries, etc.

 Where irrigation from treated sewage is not feasible, the possibility of recharging ground water aquifer by sewage, treated to a certain desirable level, may be explored by taking up some experimental studies.

Water Conservation

Incentives for Water conservation: If water is available in abundance, there is a usually tendency to use it carelessly. Along with the measures towards pollution abatement it is imperative to further intensify our efforts for conservation of water to prevent water scarcity in surface water sources and ground water depletion. Price of water should reflect its scarcity value and environmental costs. It is very important to reduce water use through pricing. The need is to develop surface irrigation sources and take measures for rainwater harvesting and preventing water run-offs. There is no doubt that water harvesting is a highly desirable solution but it is an iota solution to a holistic problem of water scarcity.

Wastewater as a resource: Since, there is no dilution available in the receiving water bodies, it is important that no wastewater is discharges into them even after treatment. The efforts should be to use entire wastewater after proper treatment. There are many cases where the sewage or industrial wastewater is treated and used for various inferior uses. Many companies are coming in this business. Focus should be to promote such business. This will benefit the water quality in many ways: 1. reduce pollution 2. save water 3. save nutrients 4. reduce over-exploitation of water resources.

Wastewater Use in Agriculture: The incorporation of wastewater use planning into national water resource and agricultural planning is important, especially where dilution water in the receiving water bodies shortages exist. This is not only to protect sources of high quality waters but also to minimize wastewater treatment costs, safeguard public health and to obtain the maximum agricultural and aquacultural benefit from the nutrients that wastewater contains. Since in most of the urban centres, treatment plants either do not exist or not adequate. Wastewater use may well help reduce costs, especially if it is envisaged before new treatment works are built, because the standards of effluents required for various types of use may result in costs lower than those for normal environmental protection. The use of wastewater has been practiced in many parts of the country for centuries. Unfortunately, this form of unplanned and, in many instances unconscious, reuse is performed without any consideration of adequate health safeguards, environmentally sound practices or basic agronomic and on-farm principles.

Prevent pollution rather than control*:* Past experience has shown that remedial actions to clean up polluted water bodies are generally much more expensive than applying measures to prevent pollution from occurring. Although wastewater treatment facilities have been installed and improved over the years in many parts of the country, water pollution remains a problem. In some situations, the introduction of improved wastewater treatment has only led to increased pollution from other media, such as wastewater sludge. The most logical approach is to prevent the production of wastes that require treatment. Thus, approaches to water pollution control that focus on wastewater minimization, in-plant refinement

of raw materials and production processes, recycling of waste products, etc., should be given priority over traditional end-of pipe treatments. For water pollution originates from diffuse sources, such as agricultural use of fertilizers, which cannot be controlled by the approach mentioned above. Instead, the principle of "best environmental practice" should be applied to minimize non-point source pollution.

Apply the polluter-pays-principle: The polluter-pays-principle, where the costs of pollution prevention, control and reduction measures are borne by the polluter, is not a new concept but has not yet been fully implemented, despite the fact that it is widely recognized that the perception of water as a free commodity can no longer be maintained. The principle is an economic instrument that is aimed at affecting behavior, i.e. by encouraging and inducing behavior that puts less strain on the environment. Examples of attempts to apply this principle include financial charges on sewage generated by urban population, industrial waste-water discharges and special taxes on pesticides. The difficulty or reluctance encountered in implementing the polluter-pays principle is probably due to its social and economic implications. Full application of the principle would upset existing subsidized programmes (implemented for social reasons) for supply of water and removal of wastewater in India. Nevertheless, even if the full implementation of the polluter-pays-principle is not feasible at present, it should be maintained as the ultimate goal.

Balance economic and regulatory instruments: Until now, regulatory instruments have been heavily relied upon. Economic instruments, typically in the form of wastewater discharge fees and fines, have been introduced to a lesser extent. Compared with economic instruments, the advantages of the regulatory approach to water pollution control is that it offers a reasonable degree of predictability about the reduction of pollution, i.e. it offers control to authorities over what environmental goals can be achieved and when they can be achieved. A major disadvantage of the regulatory approach is its economic inefficiency. Economic instruments have the advantages of providing incentives to polluters to modify their behaviour in support of pollution control and of providing revenue to finance pollution control activities. In addition, they are much better suited to combating nonpoint sources of pollution. The setting of prices and charges are crucial to the success of economic instruments. If charges are too low, polluters may opt to pollute and to pay, whereas if charges are too high they may inhibit economic development. Against this background it seems appropriate, therefore, to apply a mixture of regulatory and economic instruments for controlling water pollution.

Establish mechanisms for cross-sectorial integration: Since water quality management is related to many sectors, their involvement is very crucial in implementing various policies and regulations. In order to ensure the co-ordination of water pollution control efforts within water-related sectors, a formal

mechanisms and means of co-operation and information exchange need to be established.

Encourage participatory approach with involvement of all relevant stakeholders: The participatory approach involves raising awareness of the importance of water pollution control among policy-makers and the general public. Decisions should be taken with full public consultation and with the involvement of groups affected by the planning and implementation of water pollution control activities. This means, for example, that the public should be kept continuously informed, be given opportunities to express their views, knowledge and priorities, and it should be apparent that their views have been taken into account. Various methods exist to implement public participation, such as interviews, public information sessions and hearings, expert panel hearings and site visits. The most appropriate method for each situation should take account of local social, political, historical, cultural and other factors. Public participation may take time but it increases public support for the final decision or result and, ideally, contributes to the convergence of the views of the public, governmental authorities and industry on environmental priorities and on water pollution control measures.

Give open access to information on water pollution: This principle is directly related to the principle of involvement of the general public in the monitoring, decision-making process, because a precondition for participation is free access to information held by public authorities. Open access to information helps to stimulate understanding, discussions and suggestions for solutions of water quality problems.

Promote interstate co-operation on water pollution control: Trans-boundary water pollution, typically encountered in large rivers, requires interstate co-operation and co-ordination of efforts in order to be effective.

Lack of recognition of this fact may lead to wasteful investments in pollution load reductions in one state if, due to lack of cooperation, measures are introduced upstream that have counteractive effects. Permanent interstate bodies with representatives from riparian states can be established, with the objective of strengthening interstate co-operation on the pollution control of the shared water resources.

Economic Instrument for Pollution Control: Besides the 'command and control' regulatory mechanism the government should introduced major economic incentives for pollution abatement in developing countries, not as alternative to regulation but only as a supplementary measure. A water law should be introduced, empowering the state pollution control boards to levy a cess on local authorities supplying water to consumers and on consumption of water for certain specified activities. The Law also should provide for a rebate on the cess payable if the person or local authority concerned installs a plant to treat sewage or trade effluent. Besides the Water Law, efforts have to be made to introduce and implement the

Zero discharge concepts, which would enhance recycle and reuse of effluent discharge.

Waste minimization and clean technologies: It may be noted that by recycling techniques the waste concentrations may increase, however the total load remain the same. The concentration of waste strength would help the economical conversion of spent wash to biofertilizer.

Waste strength reduction can be achieved by adopting in plant control measures such as reduction of spillages of wastes, elimination of process failures, use of proper equipment for handling and dry cleaning techniques etc. This is often termed as clean technologies; it does not add to the cost of production, in fact industry gains from it. Innovation in pollution prevention/waste minimization efforts on the part of the industries needs to be sternly promoted.

All organic wastes are best source of energy. A number of anaerobic technologies are now available for treatment of organic industrial effluents. Spent wash, black liquor (pulp mill), dairy effluents, sugar factory effluents and press mud etc. are some of the organic wastes tried for energy recovery. The energy recovery will incidentally solve the air pollution problem, as biogas is a cleaner fuel compared to baggasse, rice husk or coal. It is essential to introduce energy audit in all the industries so hat cost-benefit ratio can be established in each case.

Bio-fertilizers are now prepared from organic rich wastes by admixing filler materials. Spent wash is converted to manure by addition of press mud, bagasse cillo, agricultural residues etc. In this technology the entire liquor effluent is converted into solid mass and it can be termed as "Zero-discharge" technology.

ECONOMICS FOR ECOLOGY IN CONDITIONS INCREASING GLOBAL INSTABILITY

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Over the past 20 years, when our country was granted the status of an independent state, it and many other countries suffered from the consequences of instability. Some economies have suffered devastating effects of full scale ecological disasters military conflicts. But in modern terms into first place go global ecological problems, problems of instability harmonization cooperation between society and nature. But in modern terms into first place go global ecological problems, problems of instability harmonization cooperation between society and nature.

The study problems of economic development, globalization and instability devoted many worksof both domestic and international scientists, including:

L.Bezchasnoho, F. Allen, A. Williamson, J. Belinska, V. Geets, J. stung. V.Kozaka, E. Libanova, I.Lukinova, R. Lahunof, D.Bohyni.

Objective: To analyze causes and effects of destabilization the purpose of forecasting shocks to the national economy and the development of mechanisms to prevention in the future, improve risk management for national enterprises.

Experience of the last century and the beginning of this proves that the most dangerous thing for the economic system of a particular country and for financial - economic system of the world is a global financial instability. And this is a scary consequence of ever growing integration and globalization of world economies. We believe that a shining example that clearly demonstrates this statement as an international processes are happening today in almost all countries of the world, because the U.S. mortgage crisis.

At the present stage almost all developed countries, there are strategic research centers devoted to study of the global future. They try predict and prevent consequences of instability, develop financial strategies for the long term, develop protective mechanisms of the environment and improvement of its condition, circuit rational use of resources in society for present and future generations.

Economic instability may be due to several of different reasons: widespread ecological catastrophe, long political crisis and political instability, credit poverty, absence adequate prediction models of socio-economic development, food crisis, military conflicts.

Ecological potential global economy increasingly undermined economic activities of people. The answer to this was the concept of environmental sustainability. It involves the development of all countries, taking into account the real needs, but not ignoring the the interests of future society. Protection of the environment is an important part of development. Somewhere early in the second half of the 20th century, economists around the world have begun to think about the need for industrial activity without compromising the ecological condition. Society understand the importance of environmental problems for economic development. It became clear that if the degradation of the environment and will continue to be the same dramatic progress, they can reproduce itself that after all would threaten society irreversible destruction and depletion of resources, which they have yet possess.

Ukraine, which always experiencing of painful bumps in a different context, is to think about the construction of antirecessionary mechanism, especially acute this the need for a increased global instability. The Japanese economy is an efficient user of crisis and financial strategies for a long time. After constant natural disasters compelled rebuilding the country again almost from the ground up but it is not in record low time. For example, in June, Japan's economy lies a phase of decline, experiencing the the consequences of the March natural disasterand already a few monthswas decided the most difficult problems. So they succeeded build a workable scheme consistently support the national economy that has real

results and analogue which could be used and Ukrainian authorities are on the territory of the state.

Let us consider some global ecological problems of our time, that increase global instability. It should be noted that this list is not stationary. With the development of human civilization, it constantly updated and the priority directions are changing their orientations.

Globally gets food problem, which is shortage vitally important food (as a consequence of having malnutrition and hunger).

The global energy problem, which was mainly caused by the fast increase in global consumption of fossil fuels in the XX century. Already now in the global energy market is felt increase of competition between developed and great industrialized countries (China, India, Brazil).

Over the last century humanity feel the shortage of fresh water. Many rivers and lakes have become a gutters, many springs of water are polluted.

Problem World Ocean - is a problem preservation and rational use of its space and resources. Nowadays World Ocean as a closed ecological system with difficulty can withstand is many times intensified human pressure and creates a real danger of death.

Global demographic problem is ambiguous nature. In some regions of the world (China)we can observe a demographic boom. In some other parts of the same (mostly in the European continent) - demographic aging of the population.

Resolving these problems is today important task for all humanity. From what when and how they start be addressed depends on the survival of people. The subsequent sustainable development of the world space will depend on their decision or deepening.

APPROACHES TO GENERATE A SYSTEM OF SOCIO-ECOLOGICAL AND ECONOMIC INDICATORS OF SUSTAINABLE WATER USE

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Beginning of the XXI century accompanied by a powerful expansion of global goods and services production which leads to a catastrophic depletion of the world's water resources. These processes make the international organizations in the field of environmental protection to raise the issue of sustainable water use-not exceeding the reduction and assimilation capabilities of water ecosystems. Economy and water quality problems is quite relevant for Ukraine due to uncontrolled use of water resources, a large part of water loss, industrial ecosystems pollution.

One of the implicit reserves to reduce water deficit is improving accounting processes of its consumption, diversion, pollution and recovery. Well-established monitoring system for water reserves quality and quantity is key to the safe water use. With this aim, first of all a coherent system of indicators, performing control and stimulating functions regarding saving and restoring the sources of "living water" (water, suitable for consumption by population) shall be formed.

Developed system of indicators should be aimed at achieving the following objectives:

1. to provide a comprehensive description of water use in the country;
2. to assess the trends of water use;
3. to identify the most important factors influencing the trends in water use.
4. Integrated system of indicators of sustainable (including safe) water use can be divided on several grounds:
5. for the subsystem focus: environmental, social, economic, legal;
6. for the territory scale: regional, basin, state, interstate, international;
7. for the globality: indicators of rational water use, indicators of sustainable water use;
8. for the areas of responsibility: hygiene, environmental, technical;
9. for the direction of water use: water consumption (enterprises, population) and water use (water tourism, fishing, recreation, hydropower, etc.);
10. for the subjects of water use: municipal enterprises, governmental organizations, industrial enterprises, population, state.

Attention should be also given to the methodological elaboration of integrated indicators of water use for the purpose of complex characteristics of water supply of the country.

Lets select the group of socio-economic indicators of water use, which most adequately characterize the state of water use of the territory (table 1).

Declared by Ukraine vector of European development requires appropriate reforms in all spheres of activity. The sphere of water use is not an exception. Processes of water use should meet European standards and norms, and indicators, calculated on the basis of national statistics should be comparable to EU figures. The first step is to ensure safe water use that would be key to healthy nation and would be an additional incentive to attraction of investments to the country.

Table 1 – Base socio-economic indicators of sustainable water use

Subsystem	Indicator
Economic	Water capacity of GDP, m^3/UAH
	Economic damage from pollution of water sources, UAH
	Economic losses from morbidity of population due to consumption of low-quality water, UAH
	The share of investment to restore aquatic ecosystems (sources),%
	The share of the fee for water use in the tariff for water,%
	Share of irrevocable water consumption in the volume of water used,%;
Environmental	Percentage of freshwater reserves, %
	Annual consumption of fresh water, m^3
	Proportion of contaminated wastewater discharged without cleaning, %
	The annual selection of surface and groundwater,m^3
	Water track, m^3/ capita
Social	Freshwater reserves per capita, m^3/capita
	Annual consumption of freshwater per capita, m^3
	Morbidity of population due to chemical pollution of water resources, cases/1000 people
	Morbidity of population due to bacteriological and viral contamination of water resources, cases/1000 people
	Proportion of population with access to safe drinking water sources,%
	Proportion of population with access to plumbing and sanitation, %
	Proportion of aqueducts without decontaminating systems, %

RECYCLING PROCESS IN UKRAINIAN ENTERPRISES

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Today there is a big problem with pollution of atmosphere, hydrosphere, and lithosphere. So it is important to find a way in which it is able to minimize the scale of this problem. There are many ways to decide them such as use less energy and product, use resources more efficiently and recycle the waste.

In Oxford dictionary, the word 'recycling' defines as 'return materials to a previous stage in a cyclic process. In general, recycling means:

1. to treat to extract reusable material;
2. to use again with minimal change;
3. a process using materials (waste) into new products to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, reduce

energy usage, reduce air pollution (from incineration) and water pollution (from land filling) by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions as compared to plastic production.

It is clear that there are eenvironmental benefits of recycling. They are:

1. reduce pollution;
2. conserve resources;
3. conserve energy;
4. reduce deforestation;
5. lower distribution costs;
6. improve corporate image among regulators, customers and the public.

There are some ISO standards elated to recycling such as ISO 15270:2008 for plastic waste and ISO 14001:2004 for environmental management control of recycling practice. The first standard establishes the different options for the recovery of plastic waste arising from pre-costumer and post-costumer sources. And using ISO 14001:2004 can provide assurance to company management and employees as well as external stakeholders that environmental impact is being measured and improved.

This type of activity is object of economic activity of many companies in over the world. Recycling companies are also in Ukraine, for example, 'Bios' (Kiev), 'Greenpower' (Kharkiv), 'Biodiesel – Crimea' (Simferopol), 'Eco Balance Service' (Chernivtsi) etc.

Donetsk region occupies 8.8% of the total area of Ukraine and there is lived 16% of the total population (22% urban population). There are produced more than 20% of all industrial products including 64% fuel industry, 43% metallurgy, 31% chemicals and petrochemicals, 25% electricity.

A level of economy in this region is higher than in other region Ukraine, but there are many ecological problems in this region. It is important to work out the environmentally sound concept of economic development in region. And in my opinion one of the part of this concept must be recycling products.

In Ukraine from recycling waste people can get energy for using in households. And cost of this energy can be less expensive to 8 times.

Products, which can be recycled in Ukraine, fridges and freezers, electrical items, household batteries, scrap metal, wood and timber hardcore and rubble, used engine oil, car batteries, textiles and shoes, plastic bottles, pots, tubs and trays, cardboard, drinks cartons, paper, glass bottles and jars, food tins and drinks cans, books etc.

We can do recycling in following ways. There are recycling materials in production process, recycling in consumer goods, cascading or down-cycling of materials.

Scientists from California State University investigated that if people had recycled 2/3 of all wastes, they could make products and energy, which could be feed Africa's population or could be provided of energy USA.

RENEWABLE ENERGY MARKETS: UKRAINIAN PERSPECTIVE

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Energy from renewable energy sources is the most dynamic and one of the most promising sectors of European and global energy, while renewable energy is seen not only as an emergency replacement of fossil organic fuels, especially oil and gas as well as economically and environmentally sound replacement of traditional fossil fuels, where even now there are all conditions for their use.

At present, the majority of the world faces serious threats of global character (effects of environmental pollution and global "warming" climate, limitations of traditional resource base). The development of alternative and renewable sources of energy (NRSE) should be regarded as an important factor in enhancing energy security. In particular, the threat to Ukraine's energy security, energy intensity is due to the economy, low level of use of alternative energy, excessive dependence on external energy sources rapidly exhaustive.

Major global trends in renewable energy are:

1. Accretion of power.

2. Investment build-up.

3. Increase in the number of companies. The number of companies involved in the use of renewable energy continues to increase. Such major corporations as «British Petroleum», «Shell», «Siemens», «Westenhouse" and others have become leaders in the European PV industry, investing millions of dollars in the production of photo module.

Imperfection of interstate institutional structures obviously restricts and constrains economic cooperation. Supranational bodies coordinating the development of fuel and hydropower facilities are primarily engaged in operational control, without affecting the basic issues of development strategy of fuel and energy, optimizing its structures.

In this connection, in January 26, 2009 in Bonn (Germany) International Renewable Energy Agency - IRENA was established; the main purpose of which is to increase the pace of broad and sustainable use of renewable energy worldwide. Besides the IRENA in this industry an international network of independent non-governmental organizations operates working in the field of energy balance - INFORSE, Network of Alternative Energy 21st century, and the European Association for Renewable Energy Eurosolar.

National mechanisms for renewable energy market regulation are often a combination of different types of management that reflect specific national and regional conditions. The first is incentives for investment in renewable energy, combined with subsidies producers of electricity or mechanisms to stimulate

demand, such as job quotas in connection with "green certificates" circulation. These mechanisms are often linked with other policy instruments such as subsidy programs, loans, tax incentives, information campaigns, etc. Incentive tariffs are greatly appreciated by investors and, in particular, by banks, financing projects.

In practice, all the tools to promote renewable energy technologies can be divided into two main groups: quantitative and price group.

The essence of "quantitative" methodology is that the government introduces a system of mandatory quotas, setting the percentage of electricity supplied to the market - traditional and based on renewable energy. In this case, a system of "green certificates" is used as a rule; it enables to take into account the volume of electricity produced by renewable energy. For example, Germany used the following combination of five main policy instruments for the development of renewable energy:

- Direct investment in research and development;
- Direct subsidies;
- Government-funded loans;
- Tax incentives;
- Grants to cover operating expenditures / reduced rates.

The use of price instruments is widespread. The vast majority of the EU members practice feed-in tariffs, which constitute either a fixed rate, independent of prevailing price levels of wholesale market, or premium to the price of wholesale market.

International experience shows that at the early stages of development of promising renewable energy sources (RES) special funds are required as the original focus on the economic efficiency of new installations makes the process of their development difficult. In addition to government support, active participation in projects introducing renewable energy sources is taken by large corporations, regional groupings and international organizations.

Large-scale use of renewable energy potential in Ukraine is not only internal but is also of considerable international importance as a significant factor of resistance to global climate change of the planet, improving the general state of Europe's energy security.

The share of renewable energy in total energy supply of Ukraine is today about 3%, and electric supply - about 6.5%, including large hydropower.

Promising directions of development of renewable energy in Ukraine are: bio-energy, mining and mine methane utilization, use of secondary energy resources (RES), off-balance sheet deposits of hydrocarbons, wind and solar energy, thermal energy of the environment, development of economically viable hydro-potential of small rivers of Ukraine.

The analysis of national renewable energy market shows that:

1. At this stage of development of RES market in Ukraine bio-energy is able to develop the most quickly. In Ukraine today there is no full market of biodiesel

and bio-ethanol. However, Ukraine has already built a dozen of biodiesel refineries with total capacity of more than 250 thousand tons per year, at least that much of ethanol today is ready to be released by enterprises of alcohol industry. According to the results in 2009 there were made more than 6 thousand tons of fuel "BIO-100. All the products were sold on the domestic market.

2. The production of ethanol and its use as a component of the top incense remains a promising building industry in Ukraine; however, it will happen mostly through private investment and construction of new enterprises. As for production of ethanol, besides "KoronAgro", this kind of projects is actively studied in Ukraine as well as by "Techinservice" company. Today, however, for European ethanol producers, including Ukrainian companies, an extremely unfavourrable conjuncture has developed. Nevertheless, the resource base for production of ethanol enables the Ukrainians to talk about Ukrainian production as a decent competitor on the European market.

3. The rapid increase in oil prices and, accordingly, on diesel fuel, as well as moderate growth in prices for raw materials: sunflower and rapeseed oil will allow biodiesel to compete with oil, creating a precedent for active biodiesel plants. Today, in Ukraine, there are about ten biodiesel plants. The largest of them are "Oriana Galev" (Kalusch, Ivano-Frankovsk region, the power of -180 thousand tonnes per year), "Liber" (Kherson, 10 thousand tons), Biopetroleum Company "(Saki, 5 tons)," Styrene "(Gorlovka, Donetsk region, 10 thousand tons) and ATU 10622 (Dnepropetrovsk, 10 tons). Neither one of them is not working at full capacity today. In 2009, several hundred tons of products for own needs (comp-auditing with DT) were produced by Stirol. Other manufacturers released products in quantities to commensurate with the parties necessary for certification.

4. According to the Statistics Committee, Ukraine has more than 7 thousand large and medium enterprises having their own waste; and which can be adjusted to the production of biogas. Some industrial facilities have the opportunity to run simultaneously 10-20 biogas plants (one biogas plant produces in average 2-3 mln. cubic meters of gas per year). One such project was implemented by "Zorg" in 2009. In particular, the biogas plant was run in the Kiev region (B.Kupol) on the territory of the LLC "Ukrainian dairy company".

5. The total capacity of wind power facilities in Ukraine is 85 MW. According to Ukrainian experts resources of wind energy are technically available for development on the continental part of our territory; it is approximately 200 times more than the current amount of generating electric power objects in Ukraine. It is expected to increase the potential of wind energy from 0.018 million tons of fuel in 2005 up to 0.7 million tons of fuel in 2030. The Sivash Lake and the coastal part of the Azov Sea could play a key role in the development of offshore wind energy; hence they supply the Crimea and Donetsk region with energy. European experience convincingly demonstrates the economic and environmental feasibility of offshore wind farms. Today we can name about ten companies that

announced their intention to develop wind energy projects; there are "Nova Echo" and "Concorde Group" among them.

6. The market of small wind energy is mainly represented by foreign manufacturers of wind generators, production of which in the country is represented by more than three dozen companies. However, there are domestic producers of this equipment. Thus, Kharkov CB “Wind World” started production of wind generators with the rated power from 150 W to 2 kW. Top product in the line producer of wind turbines is 08 FLAMINGO AERO.

7. Ukraine has considerable resources in geothermal energy, the total potential of which is estimated up to 4381 kWh per year, equivalent to stocks of fuel in the amount of 50x106 tons of fuel. Nevertheless, the country has no modern operating facilities in this area. One promising area of development of geothermal energy is creation of combined energy-technological nodes to produce electricity, heat and valuable components, which are contained in geothermal fluids.

8. Solar power system in Ukraine is mainly developed through introduction of solar collectors for hot water. Ukraine has tried and tested technology of manufacturing solar modules which transform solar energy into electricity using solar cells based on polycrystalline silicon, and exports them to Europe. Today, the only national producer of polycrystalline silicon solar battery is "Quasar" company. Company "Pillar" and "Prologue-Semikor" produce lead ingots and silicon wafers. Other market participants are engaged in selling, installing, and offer comprehensive services (including delivery and installation) to introduce alternative sources of energy.

In Ukraine there is a sufficient scientific, technological, and industrial base in all the major areas of renewable energy that, while ensuring an appropriate legal framework, is able to create the foundation for a new environmentally friendly energy industry to promote energy independence of the state.

Thus, the goal and fulfillment of the tasks allow us to draw the following conclusions:

1) it is necessary to form the national energy policy with the help of improving the legislative, legal and regulatory framework of the renewable energy development taking into account peculiarities of each type of renewable energy; development of basic economic incentive government policy to conduct of preferential policies for producers and consumers of renewable energy; the use of effective financing mechanisms, and support to the activities of public organizations; adaptation of the provisions of state programs for renewable energy development with the requirements of the EU; distribution of legal rights and responsibilities to all market participants, establishing the necessary reporting systems and mechanisms for appeal, creation of the educational system - as special technical in all the areas of renewable energy, and for the formation of energy-efficient eco-consciousness of the population.

Important tasks are:

- to prepare the forecast of fuel prices basing of the state order for evidence-based level;

- to adopt the package of environmental laws, establishing long-term standards in protecting the environment,

- to improve the organizational structure of state regulation of the electricity market.

2. Taking into consideration the current structure of regulatory power, as well as the experience of foreign countries, we propose the following system of regulation at different administrative levels. Regional energy policy should include a clear delineation of legislative authority and responsibility in the regulation of energy between the regional executive bodies and local authorities. This should be a balance of public authority's interests, utilities and energy consumers, accounting geographic asymmetry in the availability of natural energy resources in the energy mix of different regions of Ukraine.

3. For effective implementation of tasks for the development of renewable energy in Ukraine, first of all, we need a national model of development of renewable energy, as a separate energy industry - creating the legal framework to allow the development of each type of renewable energy sources, definitions of basic economic policy of the state enabling legislation and creation of renewable energy based on the conduct of preferential policies for producers and consumers of renewable energy sources, identification of funding mechanisms.

PERSPECTIVES AND CHALLENGES OF A *GREEN ECONOMY* FORMING IN UKRAINE

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A concept of *green economy* is usually includes those sectors of the economy, which are oriented on production of renewable forms of natural capital. Also *green economy* considers the areas of management, which provide products (goods and services) for environmental purposes. The ecologically oriented products, depending on their functions can be assigned as products and services that reduce ecologically distractive impact of human activities. Among the most popular environmentally friendly products are: *scientific products* (know-how, databases, plant varieties, animal breeding, design and technological documentation, etc.); *industrial products* (pollution control equipment, monitoring systems, installations for waste disposal, technology and resource efficiency, etc.), *information services* (environmental consulting services for the collection of environmental information, environmental auditing, etc.), *educational services* (education programs, training,

manuals, etc.); *management services* (technologies of social and ecological-economic systems), etc. All these products are manufactured and sold in Ukraine.

Network of green economy. Since the mid-1990s there were formed in Ukraine the scientific, methodological and organizational principles of green economy. In particular, there were grounded the reasonably possible development strategies. Thus in 2003 in Sumy State University there were developed a conceptual features for ECOPOLIS formation in Sumy region. ECOPOLIS is a scientific, industrial and educational complex for the production and sale of ecologically friendly goods and services. Since the late 2000s, Ukraine began to develop organizational and economic mechanisms to activate the green economy [2].

Certainly it would be an exaggeration to say that Ukraine is destined for success in achieving sustainable development (development that meets the needs of the present without compromising the ability of future generations to meet their own needs). However, there is a good reason to believe that current global and national conditions are exclusively favorable for changing social and economic systems in direction of sustainable development. Let's analyze priority direction of green economy firming in Ukraine.

Recreation. According to the researchers Ukraine currently uses for recreation and tourism only about 7% of territory. Also to a large extent this areas are under the influence of industrial production. Estimates show that the potential of natural resources of land, recreation and tourism (including the lands of historical and cultural significance) can be significantly improved in quality and increased in quantity. In particular for recreation and tourism could be involved about 15% of the country, which is almost double of the current figures.

According to estimates based on the use of this potential Ukraine can annually recuperate and rest about 50 million people (that is the entire population of the country). This opens up opportunities for the development of the export potential of this sector like many developed countries do. For example the level of incomes from tourism in European countries is about 5 to 8% of GDP. And in some specific countries with tourist specialization (such as Cyprus, Malta, and others), the level incomes from tourism is from 20% to 40% of GDP [1].

Alternative energy can play a crucial role in greening the economies of the country. The most important types of alternative fuels that have real prospects in the near future and can contribute to the energy balance of the country are: *biogas, briquettes and pellets, bioethanol, biodiesel, coal mine methane*.

In all these types of fuel Ukraine do has already an industrial capacities. In particular, currently it operates five plants for the production of biogas from landfills. There are several open facilities for the production of biodiesel. One of the most developed directions today is production of solid biofuels. Currently Ukraine has more than 200 manufacturers for pellets and briquettes production, they are made of different raw materials (wood chips, sawdust, straw, sunflower

husks, hulls of grains, etc.). Alternative energy can solve several critical interrelated objectives: *first of all* to *reduce the environmental impact* on the natural environment (a large part of the production of alternative energy produced from waste), and *secondly, to improve energy security* of the country (in particular, reducing dependence on foreign energy sources); *thirdly, the formation of a closed cycle of reproduction* of natural capital (production of biofuels has the closed natural cycles), and *fourthly, to promote social development rights* (the creation and exploitation of alternative energy systems requires the development of green thinking among designers, and the greening of the population life style).

Additionally there are many reasons to believe that the global and national levels do have extremely favorable conditions for transformations of national Economy. Among most important are:

- transformation of social needs of the population, resulting in the growth of demand ecological goods (education, science, recreation, sports, arts, tourism and the creative economy, etc.);
- increasing scarcity of food (and therefore, rise of prices for agricultural products) in the world markets;
- increasing demand for organic food and ecologically friendly goods, which significantly increases the economic efficiency of organic farming and the "green economy" for a number of positions;
- increasing price of fossil fuels, making cost-effective alternative energy (biogas, biodiesel, bioethanol, methane, wind and solar energy).
- reduced profitability of the "heavy" sectors of the Ukrainian economy.

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CHALLENGES OF AGRICULTURAL ADAPTATION TO CLIMATE CHANGE IN NIGERIA

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Climate change is one of the most serious environmental threats facing mankind worldwide. It affects agriculture in several ways, including its direct impact on food production. Climate change, which is attributable to the natural climate cycle and human activities, has adversely affected agricultural productivity in Africa . Available evidence shows that climate change is global, likewise its

impacts; but the most adverse effects will be felt mainly by developing countries, especially those in Africa, due to their low level of coping capabilities. Nigeria is one of these developing countries. As the planet warms, rainfall patterns shift, and extreme events such as droughts, floods, and forest fires become more frequent (Zoellick 2009), which results in poor and unpredictable yields, thereby making farmers more vulnerable, particularly in Africa (UNFCCC, 2007). Farmers (who constitute the bulk of the poor in Nigeria), face prospects of tragic crop failures, reduced agricultural productivity, increased hunger, malnutrition and diseases. It is projected that crop yield in Nigeria may fall by 10-20% by 2050 or even up to 50% due to climate change (Jones and Thornton, 2003), particularly because Nigerian agriculture is predominantly rain-fed and hence fundamentally dependent on the vagaries of weather. As the people of Nigeria strive to overcome poverty and advance economic growth, this phenomenon threatens to deepen vulnerabilities, erode hard-won gains and seriously undermine prospects for development. There is therefore the need for concerted efforts toward tackling this menace. much of climate change on agricultural research has tended to concentrate on assessing the sensitivity of various attributes of crop systems (e.g. crop/livestock yields, pest, diseases, weeds etc) - the biophysical aspects of food production, with little or no regard to the socioeconomic aspects. These partial assessments most often consider climate change effects in isolation, providing little insight into how and what the farmers are doing to cope with climate change. To better address the food security concerns that are central to economic and sustainable development agendas, it is desirable to also address these aspects of climate change and agriculture. Wisner et al (2004) reports that the vulnerability of agriculture is not determined by the nature and magnitude of environmental stress like climate change per se, but by the combination of the societal capacity to cope with and/or recover from environmental change. While the coping capacity and degree of exposure is related to environmental changes, they are both also related to changes in societal aspects such as land use and cultural practices. Challenges to agricultural adaptation to climate in Nigeria is a serious as well as important issue to be addressed because climate change is expected to present a heightened risk, new combinations of risks and potentially grave consequences, particularly in Nigeria and Africa in general. This is due to its direct dependence on rain-fed agriculture as noted above. Accordingly, there is the need for an emphasis on "anticipatory adaptation" (UNDP, 2007), that is the proactive rather than the reactive management of climate change risk. This can only be feasible if the potential problems/challenges to adaptation are preemptively analyzed. Most studies on climate change and agriculture in Nigeria have tended to concentrate on actual and projected impacts as well as farmers' coping/adaptation strategies. There has been little or no work in the area of challenges of adaptation. This paper is therefore an attempt, through a survey of the literature, to fill this gap.

Agriculture in Nigeria is predominantly in the hands of rural smallholder farmers, who have been generally described as poor and hungry. Moreover, since the discovery of oil in Nigeria, the attention of the government has been diverted away from agriculture to petroleum resource development. Again, the government style of funding for agricultural science and technology poses a challenge to climate change adaptation. Further, there are traditional farming practices that the typical Nigerian farmer is accustomed to, which he/she may find it difficult to modify or change, even though these may pose serious challenges to climate change adaptation. The next challenge is therefore traditional agricultural practices. The issue of globalization and accompanying trade liberalization, Poor infrastructure, weak institutions and bad governance are believed to be the general features of most African countries especially Nigeria. Finally, information and human capital are no less a challenge to agricultural adaptation to climate change, essentially because, the two have been widely described as poor, in most African countries.

POVERTY AND ENVIRONMENT

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The future of the environment in the world is in the hands of its people estimated about 7Billion in which over one billion are poor, 925million (13.1% of population) are hungry, half of 2.2 billion children live in poverty around the world and in less than 10years 1Billion of the population will be 60yearsand so how much of this older person can contribute back to the society?, when the birth to death ratio is about 2.341:1. [1]

Poverty is the major cause and consequence of environmental degradation that threatens the world's health status. The major global environmental challenges include global warming, state of oceans and rivers, air pollution. Growing environmental debts is the major concern to many countries because the cost of remedial actions will be far greater than preventive actions.[3]

- Poverty: is the situation where people and/or community lack basic needs, the resources and essentials to enjoy a minimum standard of life and well being that is considered acceptable in the society.

- Environment: is the sum total of all surroundings of a living organism, including natural resources and other living things which provide condition for sustainable development and growth, as well as the source of danger and damage.

Environment-poverty is a two-way relationship which represents the two global challenges, the mystery as whether to link them or not; it is rather undisputable that poor often become victims of environmental destruction. They

depend heavily on the resources provided by natural resources, they utilize less than what they consume. (UNDP (1998'66)).

The major causes of poverty are:

1. Illiteracy: Victors Hugus said that "he who opens a school door, he closes a prison". For those people who have developed, they have learnt how to read, how to write, and to be disciplined; and the price for those who have refused education or been denied of it is poverty.
2. Income: for a country to create a comparative advantage, it needs to retain its best people by providing a reasonable income.
3. Health: different diseases, endemic, pandemic and epidemic are the source of huge spending and have been for many years, depriving poor people of their basic requirements.

Poverty is the root cause of war and conflicts starting from the Americans, Chinese, and Bolshevik revolution, Rwanda genocide, to the current Arab world situation. War, in turn, produces profound environmental degradation; and renewed cycle of poverty by the loss in labor forces and other productive resources. Not to mention terrorism, It is important to note that most of the time terrorist do come from poor countries with high unemployment and that terrorist organization often provide much higher salaries that any other job. If any job is available at all.

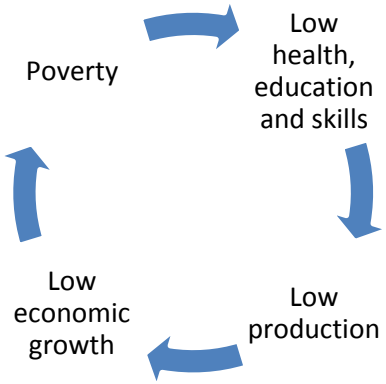

Figure 1. Poverty cycle

Its start when a nation or people are strike by poverty that lead to low health and education which is the necessary tool for a health economy, with majority of developing countries have low level of technology, the results is decreasing in production, investors run away, no real income and people save more for the future. The economy Detiorate, violence starts then increase the level poverty.

In conclusion environmental protection and poverty alleviation is not someone or a particular countries work but it's a war that everyone should win by

providing environmental education from school the higher level of education, it should be taken serious that the fail in its exam drop the overall average credit, and income distribution should be allocated and invested wisely and sustain economic development because our lives and future of our world depends it.

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TOURISM IMPACT ON ECOLOGY OF THE REGION AND ITS POPULATION

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Giltsov E.N. and Kazakov V.N. in its research «Economy of social sphere and sphere of services» that is devoted to modern development of services' sphere, declare that nowadays in developed countries, sphere of services consists to 63% of gross domestic product (GDP). For example, employment of services sphere in USA has come through the 50% in the year of 1955, in the Great Britain in the year of 1960, in France in 1970, in Japan – in 1975, in Germany and Italy in 1980, in Russia – in 1995. That index in some developing countries is still lower than 50% and shows unique growth of potential for those countries.

Quantity of employees in third sector of the Russian economy has increased only because of rapidly growth in the sphere of trade, but tourism sector also grows rather rapidly and according to experts opinion will consist about 40% of GDP in developed countries to the year of 2030. So fast growth in services sphere and especially in touristic sector explains possible environmental and ecology changes all over the world.

Scientists had started researches, concerning influence of touristic sector at the economy of different regions since, 1980. Those researches usually explain basic negative tendencies for environmental protection:

- quality of water in rivers goes down because of using gas engines;
- different noises reduce population of threatened birds and animals;
- local flora and fauna regularly destroys with different touristic impacts;
- irreversible changes in landscape and pollution of different nature resources.

There are a lot of examples, when touristic activities has negative influence at the ecology and at the economy of the certain region. So, Grand Canyon in the

United States of America is visited with a lot of different groups of tourists. The tourists changed attraction of that place very fast. Some of African parks had transformed to the piles of dust because of huge everyday tourist activity.

There are a lot more examples of negative touristic activity. Almost all the leaders of developed countries think that ecological problems should be solved after solving the economical and political questions. But that is not so, because only ecologically clean regions can be attractive for rich tourists. Only in that regions tourists can get health and unforgettable aesthetic impressions.

But destroying of nature will lead our countries to the reducing or even probably to complete disappearing tourism in the region as a branch of the economy. Concerning to the leading economists, as we noticed at the beginning, every country should be interested in developing sphere of services. Nature and touristic sector should not destroy each other. There are a lot of ways for creation simbiosisly models of tourism and ecology that will lead economy to a huge progress step for developing competitive national economy.

METHODOLOGICAL APPROACHES TO PRICE SETTING FOR THE SERVICES OF COMMUNAL ENTERPRISES BASED ON CONSERVATION OF THE RESOURCES

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Innovative progress of Ukraine's economy predetermines necessity of solving problematic issues in many fields, but communal sphere is one of the priorities. The level of everyone's life depends mainly on the quality of services provided by communal enterprises as well as the rates established by them. Now the quality of practically all utilities remains at the low level and does not meet the established standards. While the rate of tariffs is gradually increasing.

The explanation lies in the fact that almost all native communal enterprises, inherited by Ukraine from the Soviet Union period, were created basing on another scale marketing services, other strategies of technical upgrading, financial support from the government and others.

The current complicated financial and economic situation in Ukraine makes it impossible for companies of communal sector to be modernized and reconstructed. As a result, most of them are unprofitable. In turn, this leads to a significant loss of natural resources due to the obsolescence of fixed assets of such enterprises.

On the initiative of the National Commission, which performs state regulation of utilities for Communal Enterprises, the stimulatory tariff setting for services by the RAB-method (Regulatory Asset Base) is suggested for the communal enterprises. It provides the establishment of long-term utility tariffs (3-5 years) for

services of heat energy distribution, water supply and sewerage. This will encourage enterprises of the communal branch to choose a reasonable approach to the extraction and transportation of natural resources and therefore services associated with them to consume energy and generate income from invested capital.

The valid approach "*Costs + Return*" does not stimulate enterprises to invest in energy conservation, because the higher the costs are, the higher the profitability level is. Accordingly, the companies are lacking any incentives to reduce the proportion of operating expenses. No competition is available in monopolies, so the manufacturer does not need to reduce costs (in any case the product or service will be purchased by consumers).

So, if the traditional model of "*Cost +*" is represented by the expression: "*Cost + Profit (interest cost) = Price of services*", the new method puts slightly different emphasis: "*The price - Profit (requirements regarding the level of return on capital) = Cost (production by destination cost)*". The current method of "*Cost +*" enables communal enterprises to take the tariff plan operating expenses, depreciation and fixed rate of return into account, but RAB-method converts the last component of this formula into the level of return on capital. This income is determined by two components: regulatory frameworks and regulatory rate of profitability.

In the suggested tariff model the future benefits for the consumer are incorporated. It is implemented as a task for utility companies to reduce costs. The National Commission, which performs state regulation of utilities, will create the conditions that will encourage producers to look for opportunities to reduce costs. This will give the state an opportunity to establish an economically reasonable cost of utilities and stop subsidization of utilities by compensation tariff difference.

The table below shows the impact of features of stimulating tariff setting on different categories of participants in the communal sector.

Table 1 - The effect of implementation of stimulating tariff setting on different categories of communal sector

Participants	Features of the impact
Companies	Obtaining incentive to reduce costs; opening of prospects for attracting significant investment into modernization of fixed assets
Investors	Reducing the risks of investing into assets enterprises of the communal branch; guaranteed rate of return on invested capital will allow to return your money and get a profit
Consumers	Residential customers will be guaranteed of uninterrupted and qualitative supply of water and heat; the reduction of payments for accession to the networks is possible in the future

The stimulatory regulation of tariff setting will promote communal enterprises to return income on invested capital, the investment in its measures to reduce energy consumption (saved money will remain at the disposal of enterprises). Within such a tariff model approach it is practically impossible to provide services for unreasonable rates.

ENVIRONMENTALLY FRIENDLY METALLURGY IN UKRAINE

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According to the report of international analytical organization World Steel Association (WSA), Ukraine took the 10th place in the world's steel production in 2012. Traditional steel smelting technology such as usage of Marten's furnaces with natural gas as fuel causes 3 million tons of waste products a year per one furnace. Pollutants include NO_x, CO, SO_x and heavy metals dust.

Many metallurgical processes have been changed to decrease emissions to the atmosphere replacing outdated furnaces. The problem is that new technologies are quite expensive and often need the total modification of the plant. That's why the last open hearth of one of the largest Ukraine's metallurgical complexes "Donetskstal" was stopped only in 2012 but there are others still working (mostly situated at the Donetsk basin).

Nowadays the only totally green rolling producing mill in Ukraine is Interpipe Steel that is the largest investment project in Eastern Europe, comprising a total of USD $ 700 million. Strict monitoring system has been implemented during construction of the project to measure air pollution and noise volume factors and reduce their environmental and social impacts. The system of ecological management of the Company is based on the principles of sustainable development and is certificated according to the EN ISO 14001 standard.

Modern electrical steel-smelting technology used at this complex is powered by 330 kW cable transmission line from Pridneprovskaya Thermal Power Plant (TPP) to a new substation "Pechnaya". It reduces natural gas consumption in the region for 87 million m^3.

A lot of dust appears while cutting and smelting of scrap-metal used as a row material at Interpipe Steel. It includes parts of iron, lead, zinc and other heavy metals that can seriously damage people's health. New dust collecting technology implemented at the mill in combination with an absence of open burning processes cause 2.5 times less emission of harmful substances into the atmosphere.

River water consumption at the mill is reduced by 4-5 times comparing to the standards by following:

- the implementation of a 'zero-discharge' scheme (6 m^3/hour of highly mineralized flows facilitates the complex's slag cooling);
- a complete reduction of any discharge of process water into the Dnieper river.

Furthermore, Interpipe Steel takes social responsibility supporting and respecting internationally proclaimed human rights and creating the proper labor conditions according to the requirements of OHSAS 18001.

"Green metallurgy" is a great step in the development of the domestic Ukrainian pipe industry and brings a lot of ecological, economic and social benefits but it also needs a lot of money to be invested.

CORPORATE SOCIAL RESPONSIBILITY IN A CONTEXT OF SUSTAINABLE DEVELOPMENT

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"The future we want", the main document summarizing the action areas advocated by the Rio+20 conference (Rio de Janeiro, Brazil, June 20-22nd), advocates "green economy" as a main instrument to eradicate poverty, while maintaining the healthy functioning of the environment. "Green economy" is a reply to global capitalism and the excesses of its elite practitioners, as they became manifest during the recent economic crisis. A classical contribution of the private business sector to sustainable development is corporate social responsibility (CSR). The concept dovetails in the doctrine that a company is not only responsible for a positive economic performance, but also has to take care about the environmental, social and ethical aspects of its activities. Companies have to transparently report on these activities in their sustainability or CSR report. One of the main external advantages for CSR conscientious companies is that they are included by banks in ethical and sustainability portfolios. These funds, although originating in the US Methodist and Quakers traditions, are among the fast growing sections of the products offered by European banks. The CSR system is criticized by developing

countries and NGOs for its improper use of green economy products ("green washing").

The fast increasing literature on CSR contains numerous definitions of the construct. Often cited is this of the European Commission (2010) which defines corporate social responsibility as "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis". More recently the Commission moved out the explicit reference to environment and proposed a more generic definition which reads as "the responsibility for enterprises for their impacts on society" [EC (2011)].

These and other CSR definitions have in common that firms should (voluntary) go beyond their legal and contractual obligations. To meet the CSR criteria enterprises should have in place a process to integrate social, environmental, ethical, human rights and consumer concerns into their business operations and develop a core strategy in close collaboration with their stakeholders. This process should aim at:

- maximizing the shared value for their owners/shareholders and for the other stakeholders and society at large;
- identifying, preventing and mitigating their possible adverse impacts.

Calls of people to invest in "good causes" are of all times. More recently these calls gained momentum because of the problems banks runned in, the confidence they have to regain, and the civil society (including environmental ant development NGOs) becoming more vocal. This increased vocal position of the civil society is not only related to a call for more democracy, but also to the regressing, if not failing role of the governments, the growing interest of companies to promote values, the high cost and limited benefit of e.g. bank operations (a combination of high transaction costs, poor information, and high delivery costs). An important segment of this civil society in a CSR context is the fair and equitable trade/responsible investment movement.

It is difficult providing a complete list of factors which contributed to this evolution. The following elements are however important concerns:

(-) Economy should not only be driven by the "invisible hand of the market". Responsible economy should be about "common goods" or "commons", as core environmental resources (clean air, drinking water, good quality soil) which are considered abundant and therefore hardly valued in free market economies.

(-) The call for more transparency, which is based on more and better information about markets, companies, organizations, and networks.

(-) The increasing recognition that companies not only have an economic responsibility, but also social and environmental targets to pursuit. Environmental and social factors should no longer be externalized, but form an intrinsic part of the company management.

(-) Experience in countries with a delayed water treatment policy in the past, and the current refusal to deal with climate changes and atmospheric pollution, illustrate that a curing environmental policy is more expensive than a preventive and proactive one [Bénabou and Tirole (2010)].

In summary, a CSR organization is transparent, accountable, and socially responsible. It is characterized by a comprehensive management which establishes effective incentives on the above listed critical parameters. It should do so because a strategic approach to CSR is increasingly important for the competitiveness of enterprises. If well managed, it brings benefits for the internal risk management, cost savings, access to capital, customer relationships, human resources management, and innovation capacity [EC (2011)]. In short, CSR should improve the competitiveness of the company, while behaving in a more responsible way to society.

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TERRITORIAL RECREATION SYSTEMS OF SUMY REGION

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Territorial and recreation complex (TRC) - a special form of territorial organization of the economy, which is formed in the interconnected development of recreational and other economic activities on a compact territory, which has specific socio-economic and natural features; territorial system in which several types of economic activities, organizational - and functionally designed to maximize the recreational effect.

Recreational complex territorial structure of Ukraine consists of many parts. The primary component of this complex is resorts, homes and recreation centers, tourist centers. Separately placed resorts, creates recreational basis points. Settlement with several recreational places called resort. Resorts may be placed as part of the city, in which are concentrated recreational items: motels, database and

so on. The set of recreational areas and resorts that use the specified territory and placed it on infrastructure, create recreational areas. Group recreational areas creates a recreational area (eg, Krimsky, coastal area of Odessa or Nikolaev regions). Recreational areas due to transport and functional relationships create recreational areas.

Territorial recreational System (TRS) - a form of recreational activity in a particular area, which provides a functional relationship, cooperation and coordination of all subsystems, blocks and elements recreational facilities to provide recreation . In real life TRS as can be seen not often. But this theoretical model badly needed as the sample as a reference to create the most effective systems of recreational facilities, to organize a coordinated and efficient functional interaction of all components and all participants in the recreational process.

Such systems are formed on the basis of natural facilities that meet the needs of people in the area because they are viewed as recreational resources. In geography had a fairly clear idea about these resources and their methods of evaluation, including natural physiological and socio-economic elements. Some recreational resources directly consumed by the population during informal recreation.

TRS In a narrow sense consists of natural objects (resources), service establishments and consumers (tourists) that use them. With the features of outdoor activities are four basic types of TRS: 1) treatment, 2) Health: 3) Sports 4) cognitive.

In Sumy region there are the following TRS: Nature Reserve " Mihaylivska tsilina " NAS of Ukraine (Lebedinsky region), reserve national importance " Banny Yar " (Sumy region), natural monument of national importance " Ozero Shelehivske " (Lebedinsky region), landscape reserve of national importance “Serednoseymskyy” (Putyvlskyy region).

Wildlife "Mihaylivska tsilina" NAS of Ukraine (Lebedinsky region) occupies a special place among the protected sites Sumy. Its uniqueness lies in the fact that this area is protected upland meadow steppe. This small

corner neoranoho desert represents luchni steppes. Mikhailovska tsilyna is a department of Ukrainian Steppe Nature Reserve. Step its changeable lights flowers, grass sriblyastym hrayem, unique fragrance, chirping birds fascinates its visitors, gives feeling of unity with nature. Mihaylivska tsilina land is an important component of natural reserve fund of Ukraine.

Geological nature monument "Ozero Shelehivske" in Lebedinsky region covers an area of 7.0 ha. Arose ozero Shelehivske during the ice age. Helicopter forest lake resembles a huge straighten a horseshoe with green specks island in the middle. Flora is extremely rich. Many sources flowed into a small stream, which put a dam and mill. The remains of the dam survived to this day.

Botanical Conservation Area "Banny Yar" is located in the district of Sumy. Zakaznik is part of one of the largest in the steppe zone of Ukraine. This forest attracted much attention as a place for rare, relict species. Reserve "Banny Gully" - one of the most important objects of Eastern Ukraine Lypovo-maple-oak forests listed in the Green Book of Ukraine. Zakaznik the adjacent forests is promising for the creation of this natural reserve or national park.

Landscape reserve of national importance “Serednoseymskyy” - one of the most valuable objects in nature fund Sumy. Today floodplain deciduous forests are preserved only in the riverine part of the reserve, the greater part occupied by meadows and water, as well as riverside vegetation oxbow. Peserve inherent scenic landscapes, rich flora and fauna. Not far from the river Seim grows relict species - ostrich feather and koruchka deciduous - species listed in the Red Book of Ukraine. Individual copies ostrich feather in the reserve reaches five feet in height.The area of the Reserve and adjacent to his forests, meadows and wetlands is promising to create protected objects higher category - National Park.

Thus we conclude that the Sumy is also a great place to relax. There TRS data can be made active rest, get directions sport - health tourism (hiking). Tourists can enjoy the beautiful scenery, diverse flora and fauna of the primary areas.

DEEP ECOLOGY AS A PART OF ECOLOGICAL CULTURE

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The aim of Deep ecology is to analyze the complex inter-relationships between the existence of living organisms (man inclusive) and others in the ecosystem. The present day generation must study in details the relevance of living organisms within the ecosystem. They must also learn ways of improving the environment and know the effects of man’s activities in the eco system.

Deep ecology argues that the natural world is a subtle balance of complex inter-relationships in which the existence of organisms is dependent on the

existence of others in the ecosystem. It argues that the living environment deserves respect, has legal rights and can flourish.

The phrase "deep ecology" was coined by the Norwegian philosopher Arne Næss in 1973. Also called etymology, Deep ecology is not concerned with conservation of the environment only for exploitation by and for human purposes (Anthropocentric environmentalism) but it goes a long way to view the world human beings live in and seeks to apply to life the understanding that the separate parts of the ecosystem (including humans) function as a whole.

Deep ecology has 3 basic principles:

- Wilderness preservation: Several measures have been taken to preserve the wilderness areas around the world for example the wilderness act of 1964 written by Howard Zahnier.
- Human population control: This is the practice of artificially altering the rate of growth of a human population.
- Simple Living: This refers to a number of ways practiced in order to simplify one's life.

This theory has recorded some practical successes over the years some of which are as follows.

Denmark's wind farm which serves as a source of generating electricity has proven to be more environment friendly. Countries like the US, Spain, China etc has provided jobs to over 2 million of it's populates through this invention.

The sea snake which is still undergoing tests in the U. K. will also serve as a source of generating electricity.

There are no armies in Puerto Rico because she has decided to invest more in educating her citizens and protecting her forest areas.

Let's look at some disadvantages of this theory:

- Interest in nature: in the sense that the interests that a deep ecologist attributes to non-human organisms such as survival, reproduction, growth, and prosperity are really human interests
- Misunderstanding scientific information: Deep ecology can be likened to its antithesis i.e. it misunderstands scientific information and then arrives at a conclusion based on their misunderstanding, which are in turn used as justification for their ideologies.
- Deep ecology is not "deep" enough: Deep ecology has failed to link environmental crisis with authoritarianism and hierarchy.
- Shallow view superior: seeking to develop a non- anthropocentric set of values is "a hopeless quest".

In conclusion, I believe that the knowledge of Deep Ecology to an extent will guide and direct us in being environment friendly and moreover will challenge each and everyone of my readers in devising ways of relating with our ecosystem.

INTERNATIONAL ASPECT FOR ECOLOGICAL SAFETY OF INNOVATIVE TECHNOLOGIES USE

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For all types of safety ecological-economics aspect is the most actual today. A number of problems also need to be solved within separately taken state or region, but generally ecological safety of inhabitants of the Earth can be ensured only by efforts of all human beings. This requires a common understanding of the problems of the planet ecological crisis and coordinated actions of all countries and peoples.

The technological aspect should consider the principles of international cooperation in the field of environmental protection which are formulated in the UN Declaration of the Stockholm Conference on environment problems in 1972:

1. States are free to use their own resources, in accordance with their national policies in dealing with environmental problems. However, they have a responsibility to ensure that their activities do not cause damage to the environment of other States or of areas beyond the limits of the national territory.

2. Natural resources of Earth, including air, water, the earth, flora, fauna and especially representative (characteristic) samples of natural ecosystems, have to be kept for the benefit of present and future generations by careful planning of activity of the people.

3. Non-renewable resources should be developed in such a way as to be protected from exhaustion in the future and the benefit from their development in the international space should be given to all humanity.

The “Ecology” magazine (USA) gave the characteristic classification of industrial productions accepted in the USA: 1) the enterprises which, being characterized by the minimum damage to environment, can take place in the territory of America; 2) the enterprises which can be placed only within the sea basin of the USA; 3) the enterprises which have to be taken out as it is possible further from borders of the USA, for example to the developing countries of Asia and Africa at as much as expensive transportation of finished goods back in the USA.

Proceeding from this ranging, some monopolies of the USA nowadays pursue policy so-called "ecological colonialism". Its important element is so-called double standards: more expensive and perfect from the ecological point of view technology is implemented in the territory of the developed capitalist countries, and cheaper and "dirty" – developing.

The purpose for conducting the State expertise in technology transfer should become the effective identification of economic feasibility and usefulness society

and the State, taking into account possible environmental and socio-economic consequences of their use.

Effective determination of economic feasibility and usefulness of technology and its components for the state and society including possible ecological and social and economic consequences from their application has to become the purpose of carrying out state expertise in technology transfer.

Thus it is necessary to introduce practice of "best available techniques". BAT is technology which is based on the last achievements of science and technology and directed on decrease in negative impact on environment. It has an established period of practical application taking into account economic and social factors.

The concept of BAT was introduced as a key principle in the IPPC Directive 96/61/EC (Directive 2008/1/EC codified version). This Directive has been incorporated into Irish law by the Protection of the Environment Act 2003. To meet the requirements of this Directive, relevant sections of the Environmental Protection Agency Act 1992 and the Waste Management Act 1996 have been amended to replace BATNEEC (Best Available Technology not entailing Excessive Costs) with BAT. Thus, for activities falling within the scope of the Directive and regulated by these Acts, BAT must be applied.

Also the international cooperation is very important. For example, Helmholtz Centre for Environmental Research (UFZ) cooperates with research establishments and universities almost in all continents of the globe. Nowadays it units ecological investigations into one European net. By the way it happens by the impact of the sixth European Society typical research program.

The most considerable initiative is PEER (partnership in the field of ecological examines in Europe), strategic alliance of seven largest European centers for environment research (ALTERRA, Netherlands; CEH, Great Britain; CEMAGREF, France; NERI, Denmark; SYKE, Finland; JRC-IES, Italy; UFZ, Germany).

These centers which are participants of alliance, within PEER combine their efforts to carry out joint strategy in the field of ecological sciences and to improve researches for ensuring ecological stability.

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2. Best Available Techniques Guidance Notes [Електронний ресурс]. – Режим доступу: http://www.epa.ie/whatwedo/advice/bat/

GREEN ARCHITECTURE AS A WAY OF GREENING ECONOMY

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Nowadays, green architecture is being explored in order to meet the needs of people who try to adapt alternative ways of living with the changing conditions of biosphere owing to the fact that the earth suffers from continually rising temperatures, melting of icebergs, diminishing natural resources. Green architecture offers a large amount of help and solution to provide the emerging requirements of changing settings by getting to the root of the problem with nature friendly approaches. . For example, Acuff, Harris, Larsen, Magnus and Pumpbrey stated that 40,000-50,000 dollars were saved through the aggregation of energy conservation with on-site generation per year just in energy expenditure which usually takes place near the top for educational properties in Zeeland East High School (2005, p. 58). Therefore, green architecture, currently on the agenda of architectural community due to global warming, diminishing natural energy resources and the exploration of new potentials of architecture, has many impacts on global finance, human health and the energy resources.

Finance is one of the most significant issues in ecology. El Feky emphasized that GADS (Green Architecture Design Strategies) deals with the reduction of the costs of the sustainable building projects such as expanded time of architectural and engineering phases, modeling cost and time which result from integrating green buildings' fundamental elements to application (2006, p. 29). Above all, green architecture not only improves the environmental impacts of buildings, but also results in many financial benefits for builders. For example, green architecture provides energy and maintenance savings. Bradshaw, Connelly, Cook, Goldstein and Pauly indicated that Arroyo Chico houses which are mostly sold to the low-income customers with low income and it is a fact that these homes make the customers gain about $25-30 per month from the improved, energy saving ventilation systems (2005, p. 52). On account of all these facts, it can be said that people gain more energy with less money by green architecture. In addition, one of the benefits of green architecture is cost savings during the design phase. Since it is important that the building is economically appropriate, the designer should pay attention to the costs of the building. The worth can be narrowed down by using green architecture with the government's help. UNEP stated that public-sector and local financial institutions are assisted by the government to share the risk which is born from the energy-efficiency projects (2011, p. 363). Taking all these facts into account, it is clear that the government provides various facilities to users in order to make green buildings widespread. All in all, it can safely be said that green architecture provides considerable benefits about money to users. As examples

show, both financial advantages for builders and environmental benefits , which will spread during years, bring a positive aspect for green architecture.

The second important effect of green architecture is that it provides healthier space of life for people. Kats emphasized that recent surveys conducted in the field of health and comfort showed that occupants of green buildings have better air quality than that of traditional buildings (2010, p. 46). To begin with, green architecture provides people with better living conditions which have significant impacts on them. For example, high quality of air and respiratory systems prevents many diseases. Seppanen et al. (cited in US Department of Energy [USDE], 2003, p. 3-2) stated that the main reason for diseases such as lassitude, headache and dizziness is the low ventilation rate per person. Fisk (cited in USDE, 2002, p. 3-2) indicated that allergy and asthma symptoms begin to emerge with dust and high humidity within the buildings. As Sieber et al. (cited in USDE, 2003, p. 3-2) added, air filtration and humidity control should be used to avoid the symptoms of asthma and allergies. Seppanen et al. and Fisk's research (cited in USDE, 2003) also pointed out that contagious diseases which spread by airborne microbes are transmitted through the respiratory system. Good ventilation in crowded places reduces the spread of disease through the circulation (p. 3-2). In view of all this information, it can be claimed that size and location of ventilation is very important in terms of human health in architectural design. In addition, daylight has an important role in optical health. The maximum amount of daylight received improves visual perception and ensures high performance. Heschong (cited in Cheshire, 2011, p. 12) reported that according to research in schools, students are 10 to 20 percent more successful in exams. According to research in offices, performance of workers increases between 10 and 16 percent. Figuero et al. (cited in Cheshire, 2011, p. 12) noted that personnel of the offices with windows allocate 15 percent more time to work than the personnel of offices without windows. Elzeyadi (cited in Cheshire, 2011) added that less glare between 3 and 7 percent provides faster reading and reduces the possibility of making a mistake (p. 12). In the light of all these facts, it is undeniable that improved visual performance brings high working performance. For this reason, windows should be positioned to take advantage of the maximum amount of daylight. In brief, it is obvious that improving the performance requirements of emerging environmental factors provides occupants with better living conditions.

Global finance, human health and energy resources are affected by green architecture which is the trending topic of architectural affairs. Green architecture takes an important place on global economy with its benefits and risks. Additionally, it is possible to obtain healthier societies by means of green design since it affects individuals physically, psychologically and socially. Finally, reduction of natural resource usage and environmental pollution are the main impacts of green architecture on energy resources. In short, it is obvious that green buildings result in better and more sustainable conditions for both people and

nature. Therefore, the growth on awareness and demand of green architecture in public, design community and market seems inevitable. Consequently, the exploration of green architecture should be supported by prospective studies and practices in the name of renewing current economy and ecology. For further research in green architecture, it is highly recommended that green conception must be updated in the light of ever-changing parameters of technology and nature.

WORLD DEVELOPMENT OF WIND POWER PLANTS AS AN EXAMPLE OF COSMOPOLITAN PATRIOTISM

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It is known that the education of patriotism begins with understanding the values of the fatherland. Love and devotion to the Motherland formed with appreciation of beauty their homes, with a love of trees, flowers and peace of father's house.

Kant in his essay "Metaphysics of Morals"(1797) writes that the man patriot is a man cosmopolitan. Kant's logic is following. Patriotism - the consciousness of patriotic duty. This consciousness is ancestral to humans [1]. The very definition of patriotism through the duty requires a person to be able to rise above the natural tendency to identify themselves only with "their" community (ethnic group, culture, and nation). And pour him into a very wide scope of patriotism as identification with humanity. Only such a person is able to perform a patriotic duty to their ethnicity, their culture, their nation [2].

In 1966, Kenneth Boulding in a classic essay, "The Economics of the Coming Spaceship Earth"[3], suggested that the human race behaves like cowboys on spaces with an open boundary, whereas in fact we live on a living spaceship with a finely balanced life-support system. Therefore, it is necessary to safe our spaceship in proper conditions it is necessary to be a patriotic to the whole planet. One of the ways of protecting our future is using of the alternative sources of energy.

About 1% of the solar energy received by Earth drives the atmospheric air masses. This happens when the air begins to move because of the difference in temperature in different parts of the planet. In general, this energy is 100 times greater than all world energy consumption. But only a small portion of this energy is used in practice. Mankind learned to use wind energy long time ago. Already 3000 years ago, a man travelled by sea for long distances, using wind energy. Today wind energy is experiencing a renaissance, and is used more and more.

In Russia, for the last 5 years number of new wind turbine units were built and put into operation. 4 units are In Bashkiria. Each has power 550 kW. in the

Kaliningrad region, there are r 20 units on the sea shore, and the capacity of wind power is 4.5 MW. There were erected two wind turbines of 250 kW each on The Commander Islands, one 200 kW wind turbine was put into operation in Murmansk. The total capacity of wind turbines in Russia exceeded 10 MW.

Former Federal Republics of the USSR, now - the independent states, also started development of their wind energy potential. Ukraine has even passed a law to simplify the creation and operation of wind power plants. According to international statistics, the capacity of wind turbines in Ukraine is more than 5 MW. In Estonia and other Baltic countries, wind turbines are common on farms in the Baltic islands and in coastal areas. Belarus has built several wind turbines with total capacity of about 1 MW. Republic of Kazakhstan is actively involved in wind power energy. And there is even investment project of wind power station Dzungarian Gates, power of which will be 5 MW.

Other republics, located in Central Asia can also use the presence on their territories deserts, hills and sea coasts, in order to build wind turbine, however, some of them have considerable resources of carbon fossil fuels that can compete with wind energy, for example in Turkmenistan.

Azerbaijan also has rich deposits of oil and gas. At the same time, far-sighted policy is the preservation of non-renewable fuel resources and development of renewable. The most difficult situation is in Armenia and Georgia. In the mountains, the wind certainly blows, but it is difficult to determine exactly perspective sites for wind turbines. Construction in the mountains also is much more complicated than in the plains. In addition, Armenia has again launched nuclear power plant [4].

The advantages of wind power are:

• Wind power does not pollute the environment.

• Wind power, as well as bioenergy, under certain conditions (high wind speed, expensive fuel for conventional power plants) can successfully compete with non-renewable energy sources.

Disadvantages of wind power plants

• The wind is very unstable, with sudden strong gusts and lulls. This complicates the use of wind energy. This is probably the only and indisputable lack of wind. Technical solutions that would compensate for this - the number one wind power.

• Wind farms create a lot of noise. This thesis is very controversial - European rules wind turbines are placed at a distance from residential buildings that the noise from the blades did not exceed 35-40 decibels

Being a patriotic to our planet and using the alternative sources of energy will lead to maintaining good conditions for saving the Earth for the future generations.

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CALCULATION OF THE ENERGY EFFICIENCY IMPROVING FOR THE BAKERY PRODUCTS COOLING PROCESS

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Currently, because of the increase in energy prices there is a need to create energy-saving technologies in the housing and utilities sector and in various industries. In the food industry this issue matures very serious. Baking industry also does not stand aside. Bakery products production requires the high energy consumption in the technological stages such as baking, proving and cooling.

The cooling process of just taken out from the oven bread is one of the final operations of manufacturing of bakery products. It was followed in the following sections of the technological chain by slicing and packaging of products. Actually They are these operations cause the need for cooling bread. The loaf cannot be neatly cut due to the adhesive properties of fresh bread crumb at high temperatures. High-quality cutting is only possible at temperatures lower than 37 ^{o}C. Packaging of the hot products into the a film is also undesirable because it leads to the condensation of evaporated moisture on the inside of packaging and subsequent wetting of the crust, loss of identity, and the development of micro-organisms on the surface of the product.

Moreover, after the release from the oven bread begins to lose moisture rapidly and shrink (shrinkage of 4.5 ... 4.7%). This leads to economic losses of the enterprise. For large bakeries producing about 170,000 kg per day, shrinkage losses can be up to 9 tons. It is proved that in order to reduce the shrinkage it is necessary to rapidly cool the product, and then store it in slow-drying and slow-staling conditions. Currently, cooling and storage of freshly baked goods is conducted in a number of ways: in cooling chamber on fixed pallets, in vacuum systems, and using tunnel or spiral cooling conveyor system [1], which are now widely used. For large bakeries and plants, the department of cooling chambers requires considerable space; this in today's enterprise is a limiting factor due to the lack of space for the introduction of additional capacity. Furthermore, the cooling of bakery products in cooling chambers lasts several hours. This is unacceptable, since during the long-term cooling the quality of baked products deteriorates.

Bakery products are staled and contaminated by microbes [2]. Vacuum systems do not require a large area, but at the moment they have a relatively low productivity and high operating costs, so now in the direction of increasing the performance of such devices, and vacuum cooling processes active research. Tunnel conveyor systems are a camera, conveyor, conveying the product along the tunnel, and air conditioning system. Such plants have a definite advantage over cooling chambers with the natural cooling of the product - they occupy less space, and for this reason, such systems are widely used now.

The cooling process at such facilities is following: from the technological equipment product joins the spiral conveyor system. The conveyor moves smoothly without jerking at a constant speed, this ensures the proper location of the product on the belt during the passage of all levels - from the bottom to the top within 145 minutes. Fans conduct convectional cooling. The chilled products are poured into a hopper from the top.

After the series of experimental studies a mathematical model of bakery products cooling was developed. Model showed high convergence of the calculated values with experimental results [3]. The model allows to calculate various parameters related to cooling of bakery products of different variety.

Different types of products require different temperature and humidity conditions and the speed of air blowing products, hence their cooling requires different amount of energy.

Obviously, in order to increase the energy efficiency of the bakery products cooling processes it is necessary for each type of product to use cooling with parameters that take into account the thermal properties of the products, given that the belt speed is constant.

ECOSYSTEM SERVICES PROVIDING SHELTERBELTS

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In Ukraine, the largest user of natural resources is the agricultural complex. About 60% of the country's lands are used for agricultural purposes [1]. During the years of independence, the system of land use in agriculture has completely changed. Emergence of a large number of owners and lessees of farmland increases the range of stakeholders in Agriculture and Natural Resources. New land users, in most cases, have no agronomic knowledge and take land and agro-ecosystems as a source of quick profits [2]. Farmland cannot be considered only as an economic object, place to work and receive products or food. Fields, pastures, fallow and other farmland with surrounding elements and components of the

ecosystem are a dynamic complex of vegetation, animals and microorganisms with nonliving environment interacting as a functional unit. Man in agroecosystems is a part and at the same times one of the main factors that determines its activity status and future of these ecosystems. Against this background, it is important to introduce new tools for an ecosystem approach to the farm management, not only for the preservation of the ecological balance, but also to increase the economic efficiency of agricultural sphere.

The aim of our study is to determine the range of ecosystem services that provide shelterbelts according to the system of ecosystem functions and services proposed by de Groot et al.

It is known that shelterbelts reduce wind speed, snow delayed on the fields, reduce runoff, increase soil moisture, prevent wind erosion, increase and stabilize crop yields, and thus play an important role in the environment shaping.

For example, 40-80 mm increase of the average precipitation, mean annual temperature amplitude decreased by 2-3 ° C, the amount of dry winds decreased to 7-15 days, snowmelt runoff and rain water fell at 1.9% was marked under the influence of artificial forest plantations and network of shelterbelts in Mariupol Forest Research Station during the past 30-40 years. Under the influence of shelterbelts: wind speed reduced at 25-60%, and the humidity of air is increased at 5-20%, soil moisture on the fields increases at 15-30%, evaporation is reduced at 20-25% [3]. Under conditions of high and increased amounts of shelterbelts increase plant water content and heat loss by evaporation grow to 21-23%. Approximately the same number of reduced turbulent heat flux in the surface air compared to the open field. A dense network of shelterbelts with well blown by wind constructions best to ensure the preservation and distribution of snow in the fields. Mass of snow under the protection of shelterbelts increases to 101% as compared to the open field, the rate of equal distribution the snow is 0.64. In the fields protected by shelterbelts of other constructions and consistency these parameters are 72-16% and 0,23-0,15 respectively. Spring soil moisture on the fields is determined mainly by supplies snow water that accordingly affects productivity and other indicators [4]. Shelterbelts up to 10 H on slope lands contribute to the formation more powerful soil horizons, up to 76-95%. Accumulation of calcium confirms improve soil structure also increases the humus content by 20-40% compared with control and increased soil pore - to 9% [3,5]. Increase of humus in the layer 0-50 cm under 42-year-old shelterbelts was 14.79 t/ha, under fields - 3.36 t/ha. [6].

Forest shelter belts positively influence the biotic factors of soil adjacent directly to them. Shelterbelts with well blown by wind constructions commit the biggest impact, their influence can be traced to 30 H, there is an increased biological (destroying cellulose) activity of soils (38.3%), microbial biomass (1627 mg/day/kg), enzyme (5.702 sm 3 /gr/min) nitrogen-3fixing activity (64 mg/kg), the number of earthworms (57 ind./m 2) and their biomass (56.8 g/m 2), for

comparison with dense structure and openwork design of shelterbelts, where rates on average below 3.5 -49.1% [7].

Reserves of biomass in shelterbelts depend on the type of soil, climate, age, type of plantings and other factors. Maximum biomass accounted for in forest belts into the forest-steppe zone is 1540-1780 kg/ha, less in the steppe zone - 990-1290 kg/ha. Mixed plantings have more biomass compared to pure plantings. The accumulation of chemical elements in biomass of shelterbelts reaches the largest quantities into the forest-steppe zone is 2410-3260 kg/ha in the steppe zone is 1340-1480 kg/ha. In mixed plantings there are more chemical elements than in pure plantings. The bulk of nitrogen and ash elements are stored in the tree layer. Chemical elements contained in the leaves of trees and partly in plants over the soil surface actively participate in the biological cycle. Those elements that are fixed in branches, roots and trunks of trees are especially longly excluded from circulation and returned to the ground only with the collapse of plant communities. Return of the chemical elements into plantations of forest-steppe zone and steppe zone is 340-580 kg/ha. Calcium, nitrogen, silicon, potassium, magnesium in large quantities and phosphorus, sulfur in smaller quantities are returned into soil. From 4% to 40% of the chemical elements are taken out from shelterbelts to adjacent fields. Thus the introduction culturphitocenoses in agricultural landscapes activates metabolic processes in them [8]. In addition, shelterbelts not only mean ameliorative effects - they participate restore ecological and biological balance in the agricultural lands. Belts contribute to the formation of useful fauna, creating new trophic relationships, balancing new biogeocenosis and thus serve as a reliable means of forming biological usefulness of farmland. [9]

Protective forest plantations help to increase the species diversity of flora and fauna in agroecosystems, including flora (20-80%), entomofauna (25-60%), zoofauna by 1.5 - 3 times [3]. According Budnichenko in 1965 the number of breeding birds increased to 90 species as compared to the original (zonal) more than 5 times. Birds, in its turn, control the number of other species of fauna that can be pests - insects and murine rodents and peck the seeds of various weed species [10]. Analysis of the distribution of entomofauna found 7 times more herbivores on the field compared to the number of insects in the shelterbelts. At the same time, the number of insectivorous was higher by 1.7 in shelterbelts. It should be noted that the population of insects on the edge of the forest shelterbelts is 31-48% higher than in the middle of the shelterbelts. Assessment ratio herbivores and entomophagous nearby shelterbelts edge creates conditions for natural control of pest populations and corrections the chemical processing of field [11]. Floral diversity in forest belts increases with their age and reaches 70-87% of the local natural flora. At the same time, component of segetal and ruderal flora of the forest belt is reduced by 1.5-2 times compared with flora of the field. [11,12].

Ameliorative effect regarding increasing crop yield is well known and appreciated by many researchers. G. Gladun describes generalized figures

concerning crop increase for Ukraine to 5.3 t/ha with an increase in field-protecting forest cover by 1%. On average, with sufficient forest belts fields' security, grain harvest increases at 12-19%, technical crops at 20-33%, forage crops at 22-36%. Especially noticeable is effect on the action belts in acutely dry years when productivity increases up to 30-33% compared with control. Average profitability of crops which growing within the system of shelterbelts is at 8.5% above control level. Additional harvest from the influence of 441.9 hectares shelterbelts of Ukraine is equivalent to harvest of 1 million hectares of fields. [3,5]. These are the numbers that will help you to quickly assess productive ecosystem services of shelterbelts (production function) and express this evaluation in percentage harvest and appropriate monetary equivalent.

Much more difficult is to distinguish, identify and evaluate other ecosystem functions and services, such as regulatory or information. Protective agroforestry plantations performing regulatory functions (supporting and regulating services) contribute to overall improvement of the microclimatic conditions, which in turn increases the yield and quality of productive ecosystem services.

Ecosystem functions of shelterbelts as components of agroecosystems are integral parts of the ecosystem processes that occur here and produce substantial list of ecosystem services. According to the results of our typology of ecosystem services shelterbelts found ability to perform 23 ecosystem functions presented by de Groot et al. [13] and found opportunity to supply 55 ecosystem services.

Assessment of the economic effectiveness of security contributions of the ecosystem approach to managing farms, particularly landscape farming systems shows that the most cost-requiring part of their implementation is to create forest protection plantations, including shelterbelts. When calculating the complex economic effect from the introduction of such systems, where more than crop production estimated cost of humus and other indicators revealed that the payback period of creating shelterbelts is only 1,0-2,8 years [11]. Calculations of other researchers using fewer indicators point to more long term, but the average time the payback period shelterbelts is not over 10 years.

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THE ESSENCE OF THE COMMUNITY BASED APPROACH TO THE FORMATION OF SUSTAINABLE LOCAL DEVELOPMENT

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The overall objective of the community based approach to sustainable local development is to create an enabling environment for long-term self-sustaining socio-economic and community development at a local level by promoting local self-governance and community-based initiatives.

The community based approach to sustainable local development is implemented in Ukraine by UNDP. It was used in UNDP projects: Crimea Development and Integration Programme (CIDP); Chernobyl Recovery and Development Programme (CRDP); Municipal Governance and Sustainable Development Programme (MGSDP) and Community Based Approach to Local Development (CBA).

According to research by the Kiev International Institute of Sociology (http://cba.org.ua/ua/library/documents) specific objectives of this approach are listed as the following:

1. Improve living conditions in rural, semi-urban and urban communities throughout Ukraine by promoting sustainable rehabilitation, management and operation of basic social and communal infrastructure and services through community-based self-help initiatives.

Community organisations, relevant local (village and municipal), rayon and regional authorities carry out the rehabilitation of basic social infrastructure and municipal services within major national MDG (Millennium Development Goals)-based priority:

- health;
- energy;
- environment;
- water management.

During the introduction of community projects, each participating community is guided through the following steps of participatory community development:

- sensitization and community self-assessment;
- formation of community organisations;
- community development planning;
- project identification, prioritization and implementation;
- follow-up (community progress review mechanism established so that community members can codify past achievements and build on them).

2. Demonstrate effective participatory local governance and decentralized management mechanisms throughout Ukraine for public service delivery by promoting inclusive, self-governing community organisations undertaking self-

help initiatives in partnership with local authorities, private business entities and other stakeholders.

The dialogue between community organisations and local authorities is formalized through the establishment of Local Development Forums (in case of CBA Project) and the like. Such forums are composed of representatives of local authorities and community organisations, private business, public utilities companies, and local NGOs.

3. Enhance relevant professional skills and knowledge of community organisations and local authorities to initiate and maintain participatory local development process on social economic development and public services delivery.

UNDP Projects developed institutional capacities of community organisations and local authorities to identify community needs and priority, to manage and monitor participatory local process for a sustainable social-economic development and efficient public service delivery. UNDP Projects provided training and support to ensure that efforts are carried forward to implement community development plans. Various village, municipal, rayon and oblast resource centres are created for community mobilisation.

For communities to become self-confident and raise their self-esteem, the approach provides a transfer of previous positive achievements demonstrated by UNDP Projects in a significant number of settlements in 24 regions of Ukraine and in Autonomous Republic of Crimea.

According to the approach methodology, the interested communities gather general meetings and create community organisations which might take various legal forms (NGOs, BSPs, ACMH etc.). To form a community organisation, it must be formed by at least 80% of households of the corresponding community. The priorities of community development are settled in a democratic way (by vote or survey).

The community based approach to the formation of sustainable local development activates «dormant» social capacity and willingness of people to help themselves. Such characteristics of social capital as antipaternalizm, respect for traditions, the inclusion in the decision making process and the propensity to cooperate are affected to the biggest extent. The positive effect of the community based approach is most evident on such socio-economic indicators as employment and population dynamics.

Therefore, the methodology of the community based approach to sustainable local development must actively be engaged in the short- and long-term socio-economic development of the areas and regions of Ukraine.

Ideas for the policy revealed during the research:

- the success of the methodology depends on the cultural and historical features of the local communities' previous development;

- self-help approach was often inefficient in terms of the dominant leadership or weakness of social organization;
- the success of the methodology is most likely in terms of a partnership between community, government and specialized organizations.

THE SCENARIO ANALYSIS ECOLOGICAL AND ECONOMIC EFFICIENCY REGIONAL POLICY OF UKRAINE

Nataliya Pinchuk
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In a crisis situation in Ukraine's economy is worsening many problems in society, including a major problem is the relationship between economic and environmental component. Question detection interdependent impact of economic and ecological processes was the subject of extensive discussion and detailed analysis. This requires solving the problem analysis of ecological and economic efficiency regional policy in Ukraine.

The complexity of problems of ecological and economic efficiency regional policy in Ukraine requires the development and application of advanced information systems analysts. Systems analysts predict an extended analysis of information from a scenario approach.

The scenario approach includes the following steps:

– formulation purposes of analysis;
– construction scenario;
– execution scenario;
– visualization the results of execution scenario;
– evaluation of the data using various methods and tools to identify trends of situations and / or deviations from the desired parameters.

This step approach to the problem allows for prediction ecological and economic efficiency of the regional policy of Ukraine. The lack of method implementation stages scenario approach has led to the problem design the algorithm and construction method of the technological environment the scenario analysis activity.

Ecological-economic efficiency - the relation of summary economic and ecological expenses to integral ecological-economic effect; complex assessment in space and time interaction of economic activity and environment. Determination of real ecological-economic efficiency - extremely complex problem. Social, moral, ecological consequences of the harm done by economic activity to environment, don't give in to the quantitative expression and can't be reflected in an economic assessment. Regional Policy - the sphere of society, which implements the state's

interests on regional and domestic interests most of the regions with the nature of modern regional processes as well as the goals and objectives of the society.

Scenario prediction is, inherently, a special technique of carrying out expected researches and implements to some success of the principle systemacity the forecast.

The development of systems advanced analytics, namely, software implementation scenarios analysis ecological and economic efficiency will facilitate the management and decision-making in the field of regional policy in Ukraine.

ENVIRONMENTAL ASPECTS OF INDUSTRIAL ZAPOROZHYA REGION

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For the Zaporozhya region, as one of the most industrialized loaded, environmental issues are important. According to the National Cancer Institute, Zaporozhya region is included in the five regions of Ukraine with the highest cancer. Therefore are relevant issues related to the environmental aspects of the work and the development of industry in the region.

Zaporozhya region belongs to the most technologically-laden regions of Ukraine. Most difficult problems in the area are long pollution of surface and groundwater, air and land as a result of economic activity, the accumulation of large amounts of industrial and domestic waste.

High human impacts negatively affects the biodiversity and natural landscapes, the habitat of species and in general to create a safe and attractive environment for the population.

The biggest polluters of the environment (air, water and land resources) in the region are mining, smelting and energy complex, chemical and engineering industries, residential services sector, penal colonies Enforcement of Sentences Department of Ukraine.

To stabilize the environmental situation industries Zaporozhya region are adopting:

- Measures aimed at energy and resource conservation, which help to reduce emissions to the environment and to achieve economic efficiency;
- Direct environmental actions that are performed in accordance with the law and have, in general, only environmental benefits.

With the prolonged recession, which makes saving, plant owners are more willing to give money to the first group of activities. Thus, the saving of fuel and energy resources through the introduction of energy efficiency measures in

industry Zaporozhya region in 2012 amounted to 158.712 tons of equivalent fuel, and the estimated economic effect - 589.22 mln.

Given the specifics of industrial production Zaporizhzhya region, one of the most effective ways of increasing the efficiency of fuel and energy resources is the use of secondary gas (blast furnace gas, coke gas) production and origin of waste heat produced in the main process (manufacturing) processes in the metallurgical complex of the region - PJSC " MCW "Zaporizhstal" and PJSC "DSS").

As part of the Kyoto Protocol introduced a high-tech project to install at PJSC "Zaporozhkoks" two turbine generators with total capacity of 12.0 MW, which provide the company's own electricity to 60% of its total consumption. Modernization of the power supply system of PJSC "Zaporozhkoks" involves getting a comprehensive energy-saving and environmental benefits. Production of additional electricity, accompanied by the use of coke and flue gas to have reduced carbon dioxide emissions by more than 90%, and nitrogen oxides - by 40%.

In order to save heat energy enterprise "SPC" Iskra "established an autonomous electric heating instead of district heating. Heat savings from the introduction of the event was 1.996 Gcal, and the economic effect - 1.337 mln. At JSC "Motor Sich" in order to reduce electricity consumption for the production of compressed air was reconstructed turbocompressor station business. Saving energy in this case was 1.936 million kWh. Besides, JSC "Motor Sich" actively implementing in their recreation centers and health centers wind power, and to provide these facilities with hot water - solar collectors.

To perform the environmental legislation of industry as a number of events that contributed to the reduction of emissions into the air.

Thus, the PSC "DSS" in 2012 reduced emissions of air pollutants by 39.8% due to a decrease in production and the construction of gas-cleaning bag filter technology and fugitive emissions. PJSC "Zaporozhstekloflyus" by launching a gas treatment plants reduce emissions by 63.5 tons / year. The enterprise "Zaporizhia Titanium and Magnesium Plant" in 2012 commissioned dustcleaning equipment. The company "Motor Sich" held overhaul three dust and gas cleaning plants, the issues of stormwater treatment facilities will replace the filter filling, cleaning sump, the central treatment plant installed two sump, to repair and update the packaging for the collection of industrial waste.

In general, the analysis of the measures and projects implemented by industrial enterprises, aimed at reducing the environmental burden in the Zaporozhya region, showed their high cost. At the same time, a large part of the measures aimed at energy conservation, which contributes to the economic effect and quite important for companies in the current market conditions. However, to enhance the implementation of environmental projects to stimulate the state: on the one hand, this may be an increase in payments for ongoing emissions, and on the other - tax breaks for companies that implement such projects (back environmental charge).

Thus, we can conclude that, despite the difficult economic situation, the limited financial resources, the Company Zaporozhya region continue to introduce environmental projects aimed at reducing pollution. However, it is necessary to improve legislation in the direction of promoting environmental performance of enterprises.

METHODOLOGICAL FRAMEWIORK FOR INTEGRATED ANALYSIS OF DISCOURSE FORMATION, PERCEPTION AND REPRESENTATION ON AGRICULTURAL INNOVATIONS

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This presentation is an attempt to provide a methodological framework in order to assess the performance and analyse problems of adoption of agricultural innovations. I will start this presentation by providing some hints on this underlying theoretical framework dealing with systems theory (1), infer some theoretical implications as regard to agricultural innovations (2), and then describe the methodology to tackle environmental issues, and in particular agricultural innovations (3).

1. Rosen-Giampietro's systemic framework

The basic framework I use is derived from Rosen theory of systems. He developed a theory of modelling relation to address the systemic epistemological problems associated with quantitative modelling. Rosen emphasizes the importance of making the following distinctions:

- The distinction between the reality, which cannot be known in substantive terms, and a given perception of the reality, which depends on a given stakeholder's observation generating the perception;
- The distinction between the perception of the reality (inside the mind of a given stakeholder) and its representation (the formalization used in the model).

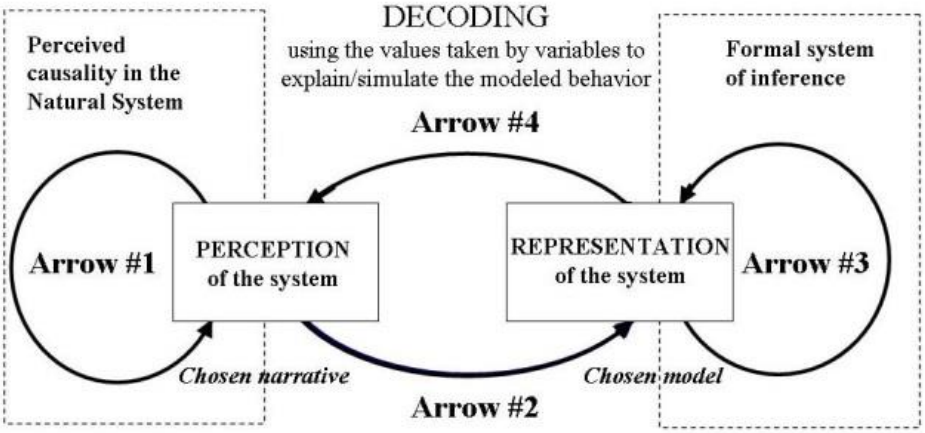

Figure 1. The scheme of modeling relation according to Rosen (1985)

Four steps are to be considered:

- Choosing a relevant narrative about the problem we want to model (in our case: a problem of adoption of innovation)
- Interfacing the narrative and representation with the external world (practices of growers, institutions, ecosystem functions, economic organization…).
- Crunching numbers
- Validation: interfacing the narrative and the representation generated in the model with the external world

2. Mapping agricultural innovations as systems

When dealing with agricultural innovations and when approaching them under a systemic perspective, we have to consider several characteristics:

- First, innovations have impacts on several hierarchical levels of the system: from the cultivated land (and even below), to the international market.
- Second, innovations have various types of impacts on the system: economic, social, technical, organisational, environmental…
- Third, the assessment of the types impacts and the perspective induced by the hierarchical level at stake, imply considering all the stakeholders involved in the design and the implementation of the innovation, as well as those who may be affected by it.

In regard to the Rosen-Giampietro's approach, this implies that we should not consider only one perception of the problem (*semantics*, ie the ways actors make sense out of a problem). Rather we should include all the non-equivalent perceptions of the problem. This entails that we should compress all the

perspectives into a unique formal representation (*grammar*, ie the language the scientist use to transcribe the semantics).

We should also consider the ways in which the semantics of perception are informed, or manipulated, or subject to power relationships. That is to say, that we have to analyse the *discourse formation* that provides the semantics for actors.

3. Methodological proposals crossing textual analysis and social multicriteria evaluation

Mapping agricultural innovations as a system may then be difficult, especially if we want to assess the overall performance according to the non-equivalent points of views of the stakeholders, and take into consideration the discourse formation.

The methodological framework we propose, offers to tackle issue of adoption of innovation in considering (i) discourse formation by means of a discourse analysis (the Alceste method of textual data treatment); (ii) the semantics behind the stakeholder's points of views by means of a sorting method (Q methodology); and (iii) provide a formal representation of the performance of the agricultural innovation by means of a multicriteria evaluation (Naiade method).

ECOLOGY AND POLLUTION

Rahmonov Buzurgmehr
Tajikistan

What can I say, about ecology. Word of "Ecology" become to wide. Nowadays human brought many benefits. Related to a huge developed science-technological progress but in that time put life on earth is on the brink of ecological disaster, Population growth, intensification of production and emission of polluting the Earth, led to dramatic changes in the nature and affect the very existence of man. Some of these changes is extremely strong and is so widespread that there are global environmental problems. There are serious problems of pollution (air, water, soil), acid rain, radiation damage to the area and the loss of individual species of plants and living organisms, the impoverishment of biological resources, deforestation and desertification of areas.

The social, economic, legal and administrative aspects of the environment in the modern world. Shows the history of the development of ecology as a specific biological knowledge and its subsequent development up to the socio-natural science status. Traced the cause of the environmental crisis and shows ways to overcome the fundamental means of improving the scientific and technical, economic and management decisions.

That why we have to protect our ecology, for some company it doesn't matter about ecology they need just earn money, government have to put restriction or

some policy for all plant, factors, petroleum station etc, I think it may be good put some seriously policy or find the solution of pollution like:
Development of clean technologies. They help to eliminate the antagonism

between man and nature, to remove limits to economic growth, sustainable use of natural resources. Waste production is not inevitable, they are the result of imperfect process;

For example. 1) Solar Energy which can change nuclear energy.

2) development of biological technologies and genetic engineering (crop rotation, green manure, biological pest control methods instead of chemicals);

3) dissemination of advanced technologies. It reduces the consumption of materials and energy intensity of the national income, turns waste into a valuable primary material for new production processes;

The introduction of advanced technologies requires additional costs. These costs will be paid back in the future. Now, they are vital. Science-based

environmental costs should be considered as a factor affecting the structure of reproduction as its objective social conditions.

ECOSYSTEM OF RELATIONSHIP HUMANITY AND NATURAL

Rahmonov Buzurgjamil
Tajikistan

Nowadays, economics and ecology became more Global problem over the world, which showing the relationship of Humanity and Ecology which start being a big problem to not using efficiently which bring us to necessity of scarcity ecology, that I will explain in topic about.

Firstly, let to remind economics and ecology by a root what means are they? The word of ECO which is starting of words economist and ecology means House, this the simple House which all we are living, it's the House which we are living, sleeping, eating, cleaning, growing, and growing plants flowers to make it more beautiful and healthy for breathing. So, now this House is our Planet or Earth which we are generally doing same things. However, what's happened now to our house? Why we are breathing pollution air, drinking harmful water, eating not quit enough natural foods, and sleeping by scaring of any natural disasters. And all of this because of Economics, which the countries using without limitation of source

ecology to increase economy to get wealthy and wealthy. But, what means the word of Economy or Economics, same thing in Ecology we are learning the source of in Economic we show how to use the resource of House. But why we have now Global problem of Economy and Global Warming? All because we forget the known of word Economy which mainly means use by a limit, use budgetly. Well, we are not using economic economly, which means we are using sources of natural without any limitation and restoring and replanting.

In sum up, I personally want to say we are destroying our house and resources which means in future we will bump into difficulties of living and unhealthy food, water and air.

SUSTAINABLE DEVELOPMENT OF REGIONAL

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Industrial development, production, and increasing number of transport in the Ukrainian regions improves logistics burden, carrying a negative impact on the environment. Therefore, the main condition for socio-ecological-economic development of Ukraine is to maintain an optimal level of environmental load by optimizing logistics flows in the regions.

According to the State Statistics Committee the highest level of harmful emissions into the atmosphere is from the road transport in Zakarpattia, Zhitomir, Kiev, Kiev, Kirovograd and Sumy region.

We offer the following measures to reduce harmful logistics influence in the Ukrainian regions:

- To develop and to implement a program for the construction of enterprises for solid waste in the region;
- To develop optimal cargo and passengers routes;
- To encourage companies to reduce pollution;
- To implement green technology;
- To create regional logistics centers in the Ukrainian regions.

With the development of industry and trade the need for the logistics centers creation increases, they are classified according to their functions:

- International Logistics Center of Distribution (LCD);
- Regional logistic distribution centers (RLCD);
- Local logistic distribution centers (LLCD);
- Trade Logistics Center of Distribution (TLCD);
- Center of Logistics Service (CLS).

It may be noted that the Regional Logistics Center (RLC) is an organized system that includes a number of different goods movement participants (suppliers,

freight forwarders, logistics operators, consumers) to streamline and rationalize the information, material and transport flows in a region to reduce the economic costs of enterprises in the supply, storage and distribution of products with the least impact on the environment to maintain the concept of sustainable development.

Thus, the concentration on the one particular area, economically independent entities are accompanied the resources synergy that may subsequently lead to the formation of a logistics cluster. This synergistic effect is to manifest itself in different variations: the sharing of a variety of material handling machinery, material handling equipment, consolidation of shipments in the same direction from different suppliers, joint procurement, etc.

In developed countries, most firms perform logistics operations such as transportation, warehousing, materials handling. In these cases, each such undertaking must have been developed by logistics infrastructure, as well as very large staff of personnel to carry out these operations. But at present, industrial, commercial and service companies prefer to give operational logistic function to intermediaries, focusing on its key activities. In connection with this selection of logistic center and related logistics providers plays a very important role for them.

Also, we note that an increase in power and size of storage unit capital cost of 1 ton of cargo and storage stocks declining, speaking for the construction of larger compositions.

Thus, RLC can enforce many functions, reducing the economic costs of small firms. In addition, logistic centers tend to promote foreign goods to market, if there are barriers to imports and there are certain national features of the market that reduce the cost of the product itself.

Characterizing ecological component creation and activity RLC, it can be noted that modern logistics centers are able to use more fuel-efficient vehicles that reduce emissions into the atmosphere and spend less fuel and lubricants.

Another advantage of RLC in the region is the ability to store reserves that are dangerous, and semi-finished components, unfinished and finished products whose value is high. It is this category of stocks requires special storage facilities that should provide protection against external influences and damage. Most businesses do not have the space to store, and if they have, cost the company dearly.

The main activities in the activities of regional logistics centers for maintenance of sustainable development regions are:

- rational use of land and the creation of "green zones";
- delivery of cargo using multiple modes of transportation in order to reduce pressure on the environment (for example, a combination between a bus and railway transport or air motor to reduce the time and delivery way);
- consolidation and transshipment of cargo from one mode to another;
- efficiency of enterprises by reducing the cost of shipping and storage products, namely small and medium-sized firms, in which the percentage of the cost of supplying and marketing has great importance;

- reducing risks during transportation of dangerous goods;
- reducing the burden on the city by giant machines;
- ensure optimal delivery of goods with the least amount of time, fuel and emissions into the environment;
- improving the quality of roads;
- attract foreign investments in the regions;
- reducing vibration and noise due to the concentration RLC outside the city;
- creation of new jobs;
- improving education workers RLC.

So we can see that the important role for maintaining the concept of sustainable development in the country is the creation and operation of regional logistics cents, which have advantages in transport organization with a combination of transport modes to enhance the efficiency and speed of delivery, flexibility in carrying traffic with the highest requirements to quality, reliability, and security of goods and transport safety.

WINEMAKING INDUSTRY IN UKRAINE: ENVIRONMENTAL AND ECONOMIC ASPECTS

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Supervisors: Yuliya Vystavna, Dmitro Diadin

Human health are influenced by four principle factors: genetic health (20%), lifestyle and quality of food (50%) of the environment (20%) and level of health care (10%). About 45% of toxic substances enter the human body with food, 30% with drinking water and beverages, and the rest is through the air.

One of the most widely consumed beverages in many parts of the world is wine, which has been well-known since the early periods of civilization. Besides its economical importance, this beverage can have a positive impact on human health, including the anti – cancer effect.

Wine is a complex matrix, which besides water, sugar and alcohol, contains a great variety of inorganic and organic components,. The composition and quality of wine is influenced by many factors related to the specific production area: grape varieties, soil and climate, culture, winemaking, transport and storage. Moderate wine consumption contributes to the daily intake of many essential metals, including Cr, Cu, Fe, Ni and Zn. Metals in wine affect its organoleptic properties, chemical composition, storage and risk associated with the daily uptake by consumers Consumption of wine may contribute to the daily dietary intake of

essential metals (i.e., copper, iron, and zinc) but can also have potentially toxic effects if metal concentrations are not kept under allowable limits.

Wine production history of Ukraine starts from the ancient time and passed several periods of the development (1860 – 1980), destruction (1980 – 1988) and the restoration (1989 – up to the present time). Current problems of wine making in Ukraine are: (i) weak systems of wine authentication control and assessment of environmental and health security of alcohols; (ii) reduction of use of local vine cultivars what are adapted to specific climate conditions and growing of foreign cultivars, what increase the use of agricultural chemicals and (iii) environmental pollution of vine-growing and wine making regions.

Reduction of use of local autochthonous cultivars which are adapted to specific regional climate conditions and growing of "on fashion" foreign cultivars is the principle tendency in Ukrainian vine growing. This dynamic leads to the increase of the agricultural chemicals use for the yield increase and protection. Thus, in order to protect the vines against diseases, weeds, and pests, different pesticides are used, what are based on organic and inorganic components. The application of agricultural chemicals is the reason of the high content of potentially toxic metals in wine. Their intensive and long-term use has raised concerns regarding the negative effects on the environment, through toxicity to aquatic and soil organisms and impacts on human health. Also, during the winemaking process, wine is exposed along the way of production, the casks/barrels/pipes used in fermentation and storage, and the vessels used for the storage and aging of wine, what can be additional sources of trace metals in the final product. Results of our research showed that wine from Crimea viticulture region are contaminated with Cu, Zn and Pb, because of the application of pesticides and pollution of the vineyard. Weak systems of wine authentication control is the another problem that constrains the development of the environmentally friendly and health secure wine production in Ukraine. Ukrainian wines are not classified according to the specific regional patterns (climate, soil, etc.) and yield's year. Trace elements composition of the soil influences the wine quality and can be used for the first step to the wine authentication in Ukraine, what will provide consumers with the information on wine quality and open the opportunities for the Ukrainian wine export.

Further developments of wine making in Ukraine should be focused on the following environmental and economic aspects: identification of the regional wine specificity, control of the wine composition, environmental monitoring of vineyards and use of local vine cultivars. The positive economic effect of such actions can facilitate the increasing of Ukrainian wine quality and health security, its value on the international market and the growth of its export.

ECOLOGICAL ECONOMICS AND GLOBALIZATION

Salome Shakarishvili
Supreme Court of Georgia

"With the end of the Cold War and with the shift from what we might call the age of national security to the age of globalization…the true economic power in the world is no longer the United States, but a phalanx of 200 large companies whose sales are the equivalent of over one-quarter of global economic activity. It is these entities that more and more determine the working conditions, the health conditions and the environmental conditions of people around the world; in this regard they have more power than the military might of the United States by itself."

John Cavanagh, Co-Chair of the International Forum on Globalization

There have been some definite advantages of globalization as it has proceeded so far. One Professor of the University of Georgia defines globalization as "processes that lead towards global interdependence and the increasing rapidity of change across vast distances". This definition by itself does not seem to be describing a malicious process—or for that matter, even a new process. Globalization has been around for thousands of years, ever since the first human groups started systems of trade and interaction with other groups. In the past this interaction has led to many positive exchanges and definitely some negative ones as well. Colonialism and its ever-present negative legacy can be viewed as forces of past globalization. But human population is so large, and interdependence so extensive, that globalization has dangerous power to trigger negative environmental, social, and economic consequences for all people and the natural world. These negative consequences need to be taken seriously. Globalization in the sense that economists and protestors use the term describes the increasing economic globalization infused with a Neoliberal economic philosophy—advocating decreased role of government and increased privatization of almost all aspects of social and private life. In this paper I generally focus on this definition of globalization while keeping the wider definition of globalization in mind.

Ecological economics is referred to as both a transdisciplinary and interdisciplinary field of academic research that aims to address the interdependence and coevolution of human economies and natural ecosistems over time and space. It is distinguished from environmental economics, which is the mainstream economic analysis of the environment, by its treatment of the economy as a subsystem of the ecosystem and its emphasis upon preserving natural capital. One survey of German economists found that ecological and environmental economics are different schools of economic thoughts, with ecological economists emphasizing "strong" sustainability.

Ecological Economics takes a unique and much-needed bottom-up approach to teaching ecological economics and political ecology, using case studies that focus on a wide range of internationally relevant topics, to teach the principles, concepts, methods and tools of these fields, which are seen as increasingly important in the context of the current triple social, economic and environmental crisis.

The importance of economic growth, globally and domestically, after World War II propelled economists into starring roles. The System of National Accounts was adopted as a standard measure of economic progress. Economists assumed "trickle down" would solve equity problems and strove to maximize growth, ignoring their own theory. Meanwhile, early ecological economists argued that pollution needed to be taken into account and that their were limits to growth.

Reducing an economic or ecological system to a set of equations means simplifying assumptions must be made that contradict with our rich understandings of reality. Thus, economists ignored the complications being discovered in the natural sciences as they formalized economics in mathematics. Yet formalizing things mathematically makes us understand how conclusions depend on assumptions and the nature of particular relationships in critical ways. Ecologists faced similar contradictions. Ecological economists seeks the best of both approaches, but methodological pluralism has problems too.

Economic activity must be ecologically sustainable. It must not degrade the integrity of the biosphere or ecological systems in the present or in the foreseeable future. This should be of paramount importance in order to sustain human life, and maintain the diverse ecological web that human life depends on. There are of course a number of much less anthropocentric reasons why this is important that are also valid. But all people can agree that in the very least the environment is important to sustain our own lives.

Ecological economics exists because a hundred years of disciplinary specialization in scientific inquiry has left us unable to understand or to manage the interactions between the human and environmental components of our world. In an interconnected evolving world, reductionist science has pushed out the envelope of knowledge in many different directions, but it has left us bereft of ideas as to how to formulate and solve problems that stem from the interactions between humans and the natural world. How is human behaviour connected to changes in hydrological, nutrient or carbon cycles? What are the feedbacks between the social and natural systems, and how do these influence the services we get from ecosystems? Ecological economics as a field attempts to answer questions such as these.

ANALYSIS OF PREREQUISITES FOR MOTIVATION OF MOTOR VEHICLE GREENING

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Road transport is one of the most important components of the national economy. However, its functioning is associated with certain environmental and economic problems that are expressed in the pollution of the atmosphere, water and land, changing the chemical composition of the soil microflora and, in the use of natural resources, the allocation of heat into the environment, creating high levels of noise . Analysts estimate that total annual economic losses of more than 20 billion in Ukraine due to the negative impact of transport on the environment.

Pollution traffic environment tends to increase. In recent years significantly increased the total number of vehicles and, consequently, the amount of harmful emissions. Of the total number of vehicles that are within Ukraine many of them is almost completely worn out and closed down. In addition, model cars produced in Ukraine are 8-10 years behind in all major indicators (efficiency, environmental performance, reliability, security) of cars produced in industrialized countries.

Poor technical and ecological condition of vehicles is the direct cause for morbidity increase. It is known that the main wealth of any nation is its human and natural (including area) capital. We believe that the basis of human capital is health, which today is due not only to material wealth, but also negative environmental impact (20-25%). It is believed that in our time, from an environmental point of view transportation is one of the most dangerous and the closest sources of pollution to the environment of human existence.

The issue of environmental safety and reduce environmental and economic damage caused by the negative impact of transport on the environment and public health necessitate improved methods of environmental management in road transport and increased motivation to its ecology.

We know that from the point of view of psychology at the source of influence on the formation and activation motifs distinguish internal and external motivation. Internal motivation (VM) driven by needs, inclinations, interests, desires of the person without any external pressure. It is believed that the VM is the source of human development as basis for its motivation, whereas extrinsic motivation does not encourage appropriate development and converts any activity on need. For orientation (sign) extrinsic motivation is divided into external negative motivation (ZNM) and external positive motivation (ZPM). As numerous surveys for high performance of a particular activity is a more favorable ratio between the three types of motivation: BM> ZPM> ZNM.

Countries with developed economies mostly use motivational mechanisms, which are based primarily on internal and external positive motivation. However,

most domestic scholars believe that the most effective methods of motivation are economic, and VM only intensifies their effect. This is due to the fact that the activation of the VM is difficult and time-consuming task. Thus, the choice of human behavior is guided by their own prevailing motives, and for their change required time. Man feels safe, because not fully understand the implications of the final ecodestructive activities and boundlessness of their own needs.

According to our belief, on top of the list of factors that contribute to poor environmental performance of the transport industry should put environmental ignorance of the population. Of course, there are other influencing factors - lack of investment and limited funding from state and local budgets environmental development, lack of funds for the simple reproduction of fixed assets as a result of lowering their cost and lack of depreciation, lack of investment in terms of concessions, public-private partnerships; imperfection leasing arrangements. However, these reasons are derived from our environmental ignorance.

It is a well known fact that the least hazardous substances emitted by vehicles while driving at speeds of 70-75 km / h. With the decrease in speed from 60 to 30 km / h emission increases by 2.2 times, and with an increase of up to 80 km / h - 3.7 times. However, due to low levels of environmental education most drivers do not follow this rule.

We believe the negative impact on the environment is only possible by changing personal and social values. To place these changes in human consciousness, a person must be environmentally educated. Only the accumulation of environmental knowledge is the path to full human development, especially in its economic development.

For most citizens of Ukraine the level of environmental awareness is still very low. At every stage of personality development transition from basic ecological knowledge, ideas preschool level to their deep understanding and practical implementation is almost not happening. People continue to use cars that have been in operation for over 20 years and have long not meet modern environmental standards. This fact can be explained by the low standard of living, but environmentally educated person understands that her ecodestructive behavior today will pay future generations, and therefore limits its consumer instincts.

Thus, to facilitate preventing negative economic and social impacts caused by the operation of motor vehicles, can be achieved by changes in social consciousness and thinking.

RESOURCE POTENTIAL OF TECHNOGENIC DEPOSITS

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Today the problem of waste has gained environmental and economic importance for many countries. Accumulation of waste is transformed into significant danger factor that affects the quality of life and is one of the real threats to environmental security.

In Ukraine from 1 billion to 700 million tons of industrial and household waste is collected annually. Today the total amount of accumulated waste in the country reached 28 billion tons of waste. In the structure of Ukraine's waste mining waste has the largest share as 88%, other industries have about 10%, household waste has about 2%. The main sources of formation of large-tonnage industrial waste in the country are more than 3.5 thousand enterprises of mining, processing, metallurgical and chemical industries. About 95% of the total volume of mining waste is generated by 22 coal-mining enterprises of the country (about 1 billion tons of waste annually). [1, 2]

Nowadays, the decrease in natural mineral deposits may be compensated by technogenic deposits. Developing technogenic deposits leads to a reduction in the cost of searching for new and exploration of worked deposits, maintaining exhaustible mineral resources in the bowels, increasing productivity through cost-effective processing of raw materials, improving working conditions, because technogenic deposits are located on the surface of the earth.

According to Hirusov E.V., because of imperfection of mining technologies up to 70% of oil, 30% of coal, 20% of iron ore is left in the bowels. Planned losses of coal are 40%, oil - 50%. During extraction of potassium salt and potash mica up to 80% of raw materials are left in the dumps. However, it was found that in the waste of Zaporozhye Titanium-magnesium Complex content of scandium, vanadium, tantalum, chromium, titanium is higher than that of natural deposits. Many expensive components are contained in the waste of Nicholaev Mercury Complex (e.g. lithium, mercury), of Cherkassy Plant of Chemicals (e.g. nickel) and other enterprises. [3, 4, 5]

Of the total amount of minerals which are involved in the system of industrial production in most cases no more than 1-5% take the form of the final product. And most of the produced waste is formed exactly at the stage of extraction and processing of natural resources. As a consequence of accumulated depreciation in the mining and manufacturing industries the waste contains a large number of resource-valuable components.

In the Ukraine there were created hundreds of large, medium and small technogenic deposits of various minerals which are suitable for industrial use.

Statistical data on the number of technogenic deposits in some regions of Ukraine outlined in the table. Its potential cost is estimated in the tens of billions of dollars.

Data of table shows that on the territory of the five areas of Ukraine most technogenic deposits are situated and most of the waste is placed.

Table 1 – Number of technogenic deposits and the volume of waste in some regions of Ukraine [6]

№	Region	Quantity of accumulation of technogenic objects	Distribution of industrial production waste (thousands of m^3)									
			Mine rocks	Stripping rocks	Waste	Ash-and-slad waste	Metallurgical slag	Stone siftings	Carbonate siftings	Phosphogypsum	Mercury cinders	Defecate
1	Volyn	24	20,1	0,087	2,03	18,84	-	-	-	17,16	-	-
2	Dnipro-petrovsk	86	439,01	2,31	209,22	54,813	31,58	0,028	-	-	-	-
3	Donetsk	96	891,254	439,701	418,51	141,012	46,85	101,014	99,482		2,66	
4	Lugansk	50	537,34	8,98	376,34	4,67	9,76	8,52	7,353	-	-	-
5	Lviv	56	24,86	73,38	44,27	14,99	-	-	-	1,8		0,54
6	In Ukraine in general	1307	-	1523,2	653,72	306,0	305,822	100,8	110,89	36,411	2,7	19

Today in Ukraine a large number of technogenic deposits of minerals is formed that have planetary scale. The practice of foreign countries shows technological possibilities of processing the waste of production and consumption to obtain high-quality end products that could meet the needs of the state and increase its export potential.

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ENERGY EFFECTIVENESS IS A FACTOR OF ADVANCEMENT ECONOMIC LEVEL OF ENTERPRISE

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Resource-saving – one of the most effective directions of development of the economy, which unite three components: energy, materials and technologies. It possesses a significant role in decrease material capacity of a social production, and resource intensity of our country production exceeds world level by 2-3 times.

Development of an effective control system by innovative resource-saving at the enterprise is especially actual in the conditions of a world rise in prices for energy carriers of an organic origin, high rates of scientific and technical progress, economy removal for qualitatively new level of resource-saving at the expense of development, development and introduction of new generations of equipment, technology and materials.

Achievement of efficiency of functioning of the enterprises in modern conditions is impossible without solution problem of rational use of resources.

Transition to resource-saving comprises such components:

• creation, introduction and use of resource-saving technologies;

• creation of essentially new highly effective types of the materials acting as substitutes of their natural analogs;

• decrease in a material capacity of a social production at the expense of creation of optimum structure of natural and raw and fuel and energy base;

• the improvement of quality of made production providing increase in term of its functioning or decrease in volumes of its consumption;

• reduction of losses of natural and raw and fuel and energy resources at all stages of their production, processing and use;

• expansion of volume of use of waste at all stages of production.

Strategy of further development of a control system by resource-saving has to meet the following requirements:

1. recognition of importance of processes of resource-saving and reflection of it for and strategic development plans of the enterprise.

2. understanding of the possible benefits received by the enterprise at carrying out policy of resource-saving.

3. performance of the calculations, allowing to estimate the total expenses connected with carrying out resource-saving actions, and also the prevented economic damage received as a result of introduction of these actions.

4. check of a control system by resource-saving on adequacy to goals of increase of efficiency of financial and economic activity of the enterprise and improvement of quality of surrounding environment.

5. ensuring effective motivation, introduction of demonstration and training programs on resource-saving.

6. ensuring development of a control system with waste, assistance of recirculation and to decrease in dependence on not renewable power sources.

Resource-saving is an important reserve of increase of production efficiency. Proceeding from it, the resource-saving concept as the main and prime component of the concept of development of the enterprise is necessary. At the expense of resource-saving it is possible to lift significantly a level of production taking into account improvement of quality of goods and services, and also to improve a state of environment.

High requirements to a resource efficiency assume updating of technologies and the equipment, use of innovative approaches in change of structure of use traditional, alternative and renewable in production processes, use of waste, raw materials replacement cheaper and available. Innovative policy of the enterprises will influence indicators of efficiency of resource use too.

Introduction at the enterprise of innovative strategy and strategy of resource-saving has the synergetic effect which is positively influencing to level of production. Realization of these directions lead to decrease in expenses and improvement of quality that, in turn, conducts to increase of competitiveness of production and the enterprise as a whole. Use of two directions allows influencing of production efficiency more strongly.

ENVIRONMENTAL SANITATION POLICY AND SOLID WASTE MANAGEMENT IN SUNYANI MUNICIPALITY[1]

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Solid Waste management is one of the least recognized public policy issues in Ghana. Quite apart from the obvious physical unattractiveness of the business, waste management often competes with more pressing economic and social issues such as fiscal and trade matters, unemployment and poverty, education and health. Even within the domain of environmental sustainability, the management of waste has had to play second fiddle to more apparently manifest challenges such as land and coastal degradation, biodiversity loss, and climate change. Waste management, however, remains a major challenge for any society, since all natural processes generate waste. The particular economic, social and environmental circumstances of the Sunyani municipality make this issue especially critical for medium to long-term sustainable development.

Environmental Sanitation Policy and good hygiene are fundamental to health, survival, growth and development. The Millennium Development Goals (MDGs) have set us on a common course to push back poverty, inequality, hunger and illness. Having a healthy urban environment sets a city on track for development. Sunyani is currently experiencing poor environmental sanitation and Solid waste disposal, in particular, has become a daunting task for the municipal authorities who seem to lack the capacity to tackle the mounting waste situation in the municipality. Open spaces and many other private and public places are littered with garbage, which in most cases clogs drains thereby creating conditions for disease vectors and posing health risks to inhabitants. The main objective of the study is to examine the causes of the environmental sanitation policy conditions and solid waste management in the Sunyani municipal Area and its effect on the health of the people. This study investigates the nature of the solid waste problem in Sunyani Municipality in the Brong Ahafo Region of Ghana. It describes the waste situation in the study areas and identifies the causes of the problem from the perspective of key stakeholders in the waste sector. The key issues identified by the study include: that Ghanaian cities are experiencing worsening solid waste situations and environmental sanitation policy but the municipal governments lack the capacities in terms of financial, logistical and human resources to cope with the situation; that while several causes of the urban waste crisis can be identified, the lack of political commitment to urban environmental management is the root cause of the worsening solid waste situation in Ghana as well as Sunyani. Poor

[1] This material was prepared while performing scientific research (# 0111U002149), 2011-2013.

environmental sanitation and solid waste cost Ghana 420 million cedis each year, equivalent to US$290 million and representing 1.6% of the national Gross Domestic Product. (GDP).

The study adopted the case study method to understand the situation in residential, other suburbs and the Central Business District (CBD) in, Sunyani. Administration of questionnaires to households in this municipality enabled the researcher to understand the people's assessment of the environmental sanitation conditions and solid waste management in these suburbs in particular and Sunyani in general. In addition, the availability of environmental sanitation facilities and services and the awareness of individuals about environmental sanitation regulations in the municipality were analysed. Policies are made as guidelines for various actors in the waste management sector to implement, but implementation also comes with resource availability and the capacity of the actors to ensure their roles in the policy are achieved. Furthermore, interviews were conducted in selected institutions and one private waste management company involved in environmental sanitation in Sunyani. These include the Waste Management Department, the Municipal Environmental Health Department and the Town and Country Planning Department. From the interviews, the challenges faced by these institutions and company in managing environmental sanitation and solid waste in Sunyani were revealed and explores the capacity of the stakeholders in the study area in relation to their roles in the Environmental Sanitation Policy of Ghana, looking at their current practices in solid waste management. The study revealed differences in environmental sanitation and solid waste behaviour among residents from the various suburbs. However, the general environmental sanitation and solid waste condition in Sunyani is not up to expectations. Individuals, households and businesses (commercial entities) do not tend to prioritize environmental sanitation. As such, people have poor attitude towards sanitation. Coupled with this are inefficiencies in service provision by the private waste management company who are contracted to ensure good sanitation in the city. The Departments within the Municipal Assembly responsible for managing the environment are also ill-resourced. The poor environmental conditions challenge the Assembly's efforts at meeting the health and environment components of the Millennium Development Goals. The study revealed that, environmentally related diseases contribute to 80 per cent of hospital admissions in Sunyani. Poor environmental sanitation cripples national development. People, households and communities lose time and money to illness, workers produce less, save and invest less and live shorter lives. It also imperils environmental sustainability, particularly, water quality and aquatic biodiversity. Some recommendations pointed to the need for intensive public education to promote a positive attitude for environmental sanitation in Sunyani and its environ. In addition, enforcement of the environmental sanitation bye-laws is also recommended to make every individual responsible for good environmental sanitation in the municipality which in the long run will lead to healthier life of the

citizenry of Ghana, more especially those in Sunyani municipality, and the study also identifies some challenges of these actors and gives recommendation of some issues which would require further research.

THE ROLE OF CREATIVITY FACTOR IN ENVIRONMENTAL INNOVATION COMPETITIVENESS IMPROVEMENT

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The creative element becomes increasingly important for development of national economy in current conditions of toughening social and economic regional differentiation and lack of financial, industrial and material resources. Due to the strengthening of global processes and the corresponding transformation of economic systems, the innovative concept of social development requires understanding of creativity as the driving force of the post-industrial economy. Current situation is that the priority of modernization of national economies goes to the development of eco-innovation. Environmental innovations are designed to safely reorganize and modernize the economy in order to implement the concept of sustainable development.

Creative development in itself and manifestation of this development in innovation is a sign of effective creative potential. Despite the fact that economists were the first who associated the idea of art (creativity) with the idea of innovative technologies implementation, the idea of "creativity" and has not received economic feasibility.

However, its definition in economics can be formulated as a dynamic process leading to the creation of technological innovation, innovation in business, marketing, and is closely related to obtaining competitive advantage in the economy. In this case, we add that in the field of environmental policy, this phenomenon takes the form of a dynamic process based on the scientific work with the aim to develop new mechanisms to address environmental and economic issues and includes the ability to generate original ideas and new ways to achieve eco-efficiency.

There is no unique definition of the “creative economy”. It is a subjective concept that has been shaped throughout this decade. The UNCTAD definition of “creative economy” is that it is an evolving concept based on creative assets potentially generating economic growth and development.

- It can foster income generation, job creation and export earnings while promoting social inclusion, cultural diversity and human development.
- It embraces economic, cultural and social aspects interacting with technology, intellectual property and tourism objectives.

- It is a set of knowledge-based economic activities with a development dimension and cross-cutting linkages at macro and micro levels to the overall economy.
- It is a feasible development option calling for innovative, multidisciplinary policy responses and interministerial action.

In our view, these features should be supplemented with the possibility of the creative economy to be a factor in increasing the competitiveness of environmental innovation (Figure 1).

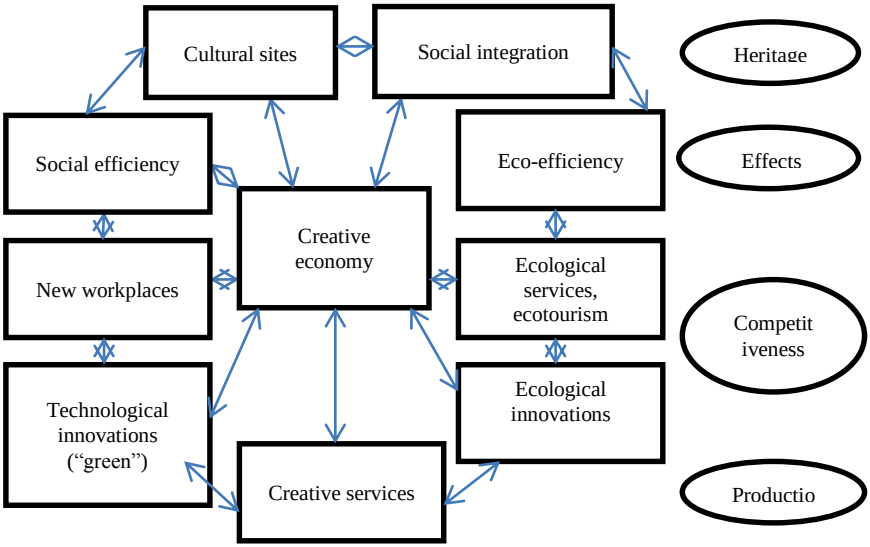

Figure 1. The classification of creative economy features

The idea of "creative economy" has been applied to the economy of the cities which led to the concept of the "creative city". This term describes the urban complex in which creative activity is an essential part of the economy. Such cities are usually built on a powerful social and cultural infrastructure. There is a large concentration of "creative" professions, as they are attractive for investment because of their cultural development.

The concept of "creative city" in the late 1980s was introduced by the British scientist Charles Landry and since then the idea has become a global movement that embodies a new paradigm of urban planning, including the environment in mind.

In these cities the production of environmental engineering and technology, which are one of the most profitable, is highly developed. The European Union today has the largest contribution to a global market of innovative environmentally

oriented technology, and its capacity is estimated at 550 billion euros. European market of environmental innovations consists of investment goods (54 billion euros) and services (129 billion euros), including non-profit services. Market sector of management of the effective usage of recourses holds 56 billion euros and the current turnover of alternative renewable energy resources and associated equipment is 5 billion euro per year.

In such a way, creativity is an important factor in the development of individual innovative products, as well as entire cities. Creativity manifests itself in attracting highly skilled, flexible use of labor, creativity and daring scientific ideas. Not only the generation and application of innovative ideas can be creative, but also the creation of opportunities for their appearance by stimulating the development of human potential.

ALTERNATIVE MECHANISMS OF FUNDING SUSTAINABILITY

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Financing of sustainable development has become a major concern for both developed and developing countries. Different global financing mechanisms have been invented so far, among which are Official Development Assistance (ODA), funds of multilateral development banks, Global environmental facility, International Emission Trading System (IETS), debt relief programmes for the Heavily Indebted Poor Countries (HIPC), various bilateral programmes etc. However, many of the latter are criticized for different reasons.

Criticism of traditional official development assistance (ODA) is centred on so-called aid addiction and dependency syndromes among governmental and non-governmental agencies. Critics of bank loans (from World Bank, Regional Development Banks) and loans from other credit institutions, such as International Monetary Fund, are concerned about the conditionalities imposed on borrower countries and advisory services, which are usually attached to its loans. Debt relief and conversions appeared to be less of a solution than expected.

To this end, international organisations and states are seeking for innovative financing instruments. At the international level, taxes on airplane tickets, kerosene, weapon sales, use of oceans or ocean-products, foreign exchange transactions, on capital and on income have been suggested as ways to raise new funds. Almost all both traditional financing instruments and innovative ones are market-based instruments, which lead primarily to striving for economic benefits. Furthermore, numerous studies on aid effectiveness show that implementing of sustainability programmes depends greatly on the ability of local institutions to

generate local revenue. That's why such mechanisms as Time Banking, Local Economic Trading System (LETS), local complementary currencies and community shares can become an alternative to market-based instruments and accumulate local resources for promoting sustainability.

TimeBanking represents an innovative form of social currency, which is based on the concept of earning and spending hours. People's skills are worth a certain time unit per hour and everyone's time cost is equal. The hours people gain helping or supporting others are stored in a "timebank", these hours can be spent getting equivalent support in time when they are in need. The philosophy of TimeBanking is described by five core values:

- people are all assets;
- some work is valuable beyond the market price;
- helping works better as a two-way street;
- we need each other;
- every human being matters.

Local Exchange Trading System (LETS), first described and established by Michael Linton in 1982, represents a self-regulated economic network that aim to establish reciprocal aid system where people can exchange all kinds of goods and services without money. LETS links untapped needs with untapped capacities. . LETS uses market-based principles, but instead of money, the currency of locally founded LETS is used. LETS systems were created as a complementation to the national currency; they were not aimed to replace them. LETS does not create a self-sufficient supply, but provides a support for the local community when access to the formal economy is restricted. Unlike TimeBanking, where brokers are used to match members' needs and wants, LETS systems generally require members to coordinate their own trades.

One of a number of local-level financing instruments aimed to substitute or complement traditional monetary relations is **local currency**. These are systems with locally issued notes or tokens that run freely alongside a country's national currency in a certain territory. Mostly it is used by individuals and businesses in an area unsupported by a LETS. They work in the same way as a national currency, but it is not backed by a national government. The main purposes of community and complementary currency systems are following:

- to build social capital;
- to promote local economic development;
- to nurture more sustainable lifestyles;
- to meet needs that mainstream money does not.

The intended effect of a local complementary currency is to increase the cost of trading with agents outside of the local area by rebalancing terms of trade in favour of local businesses. Environmental factor also plays a role for local currencies: by favouring local trade, they reduce the demand for energy-intensive processes such as storage and logistics that leads to reduced carbon production.

However, there is some evidence that not all local complementary currencies were developed with respective research on what the currency intended to achieve.

Another way to mobilise resources within a community is funding sustainability through **community shares**. In fact, all enterprises need some risk capital to start and to be sustainable. This risk finance has to come from somewhere (shareholders, investors, banks etc.). One of the main reasons why social enterprises can find it difficult to compete with private enterprises is their lack of risk capital. A root cause of this under-capitalisation is a belief that social enterprises should not have shareholders, the investors who provide capital to business. The programme that breaks this stereotype is community investment. It is the practice of members of a community buying shares or bonds in a social enterprise. It authorises communities by giving members – as part-owners – a direct say in the success of such enterprise, encouraging them to play an active part in its future. Members of the community receive a fair return on their investment as well as sharing in the social, environmental, or community benefits of the enterprise.

BENCHMARKING IN GREENING THE ECONOMY

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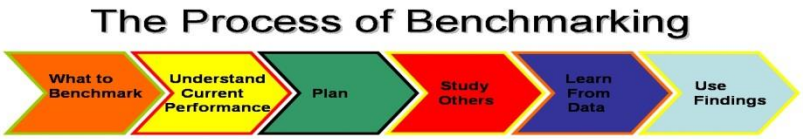
An important condition for the economy transformations, focused on reducing of eco-destructive impact of production and consumption of goods and services per unit of gross national product (i.e greening the economy) is an effectiveness of those tools that provide reduction of the "pressure" of the economy on the environment. However, according to experts, those eco-oriented tools that Ukraine uses nowadays are not able to influence the formation of the structure of the economy. This new structure of economy should include a new-generation activities and sectors, which directly or indirectly aimed at the expanded reproduction capacity of the environment to its self-healing and the needs of humanity. Therefore, one of the urgent problems of environmental regulation is to look for tools that activate the restructuring of social production considering the priorities and objectives of sustainable development.



The purpose of this study is to study the feasibility of benchmarking as a tool for greening the economy.

Taking into account an eco-oriented social needs the efficiency of environmental performance, has a strong effect on the competitiveness of companies. The practice of the world economy shows that to achieve the competitive advantages is necessary to learn, to know and to use the experience of competitors who have achieved significant success in the same field. In the scientific literature, the process of finding and exploring the best of the existing methods of doing business called benchmarking.

To compare own results with the results of competitors - not a new idea; collection of such information – a function of operational marketing. However, benchmarking is a more effective method than simply collection of information, as it allows to identify opportunities for improvement, define objects to improve and promote the continuity of the process to improve the competitiveness of the company.

The purposeful use of benchmarking began in 1979 in the corporation Xerox, when competing firms offer consumers similar in quality goods but at lower prices. This caused a launch "Benchmarking of Competitiveness", which allowed company to identify the potential of competitiveness analysing and comparison of the costs and the quality of their products with Japanese counterparts. The project was wealthy and, since that time, benchmarking has become part of the business strategies of leading corporations.

Benchmarking is a method of steady comparison, collation and evaluation, identifying the best products, services and techniques that can be adapted and applied to solve specific business problems: lower costs, reduce production cycle time, increase reliability, reduce inventory, etc. And if initially benchmarking was perceiving as a process of following the best examples, so now its focused on introducing best practices and techniques of effective management in your own business, an important component of which, of course, is an environmental protection activities.

Consequently, the process of development and practical adoption of successful experience in realization of environmental functions regarded as a special kind of benchmarking - environmental. Environmental benchmarking is effectively a tool for analysing environmentally related practices and indicators, which lead to superior environmental performance, while also enhancing economic performance. In other words, benchmarking helps companies achieve good environmental performance by learning from 'best-in-class' companies.

The scope of environmental benchmarking should include all areas of your company's activities, and not be restricted solely to those activities that have an obvious environmental impact. Therefore, it may include an assessment of environmental management systems (EMS), management performance, environmental accounting, resource and waste management, product

environmental quality, environmental education and training, customer relations and emergency response.

From other known kinds of benchmarking it differs in that it promotes rapid and less costly improvement and development process greening their own enterprise by adapting the achievements of other companies in the field of environmental management (regardless of the industry, subordination and form).

Depending on the level and the specific issues to be resolved, include the following components of environmental benchmarking:

- functional (comparing and learning from best practices of specific environmental features of competitive companies in the same or related industry, followed by the adaptation and implementation of it.)
- adaptive (identification of different greening of business practices that could help to accommodate to the changes);
- internal (analysis of the environmental departments of the company).

It should be noted that the adoption of knowledge - is an information capital (set of information assets and intellectual abilities, that brings income), which is an economic entity are attracted to its business, i.e invests. Therefore, the development of good practice of the greening economy should be viewed as an investment (in the form of intangible assets), which invested in the company in order to obtain environmental benefits. Consequently, an environmental benchmarking has some investment opportunities that able to ensure the implementation of environmental strategy in a separate organization and in the overall economy as well.

ECO-PRODUCT DEVELOPMENT ON THE GROUND OF MARKETING COMPLEX 4P[2]

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Well known Harvard marketing specialist Theodor Levitt said: “People don't want to buy a quarter-inch drill. They want a quarter-inch hole!" In other words costumer is interested not in the product itself, but in those benefits it provides, that is why it is important to satisfy costumers needs with the minimal risks for eco-system. Such tasks are to be solved by basic instruments of marketing included to complex 4P.

Popularity of eco-product came to Ukraine not so long ago, and its scale is much smaller than on the West. Choice of correct positioning of organic products,

[2] The work was performed within the state budget project "Development of the introduction of environmental innovations» (№ state registration 0112U001378)

their active promotion in sales location, let this category to hold stable position on the market. Marketing complex 4P for eco-products consists of the following (Table 1):

Table 1 – marketing complex 4P for eco-product

Product	Price	Place	Promotion
- Eco-product characteristics - Eco-product production - Packing and POS-materials	- special offers - discounts - loyalty programs	- Development of eco-shopboards - Opening of eco-stores - Promotion of sale thought dealers	- Promotion of healthy way of life - Social status - Baby foods

Product, development of which can concern:

- the product itself, so its properties, characteristics and composition;
- production techniques that do not pollute the environment, so development of waste-free production or neutralization of hazardous wastes;
- packing and POS-materials, so waiving non-organic materials usage.

Development of eco-program stimulating sales sets objectives to form social-responsible costumer who will prefer eco-product. Eco-product costumers can be divided into 3 groups (Table 2); taking into account this table, the pricing system and promotion method of eco-product are formed.

Table 2 – Classification of eco-product costumers

Costumers	Dark green	Light green	Grey-green
Characteristics	Unindifferent to eco-problems	In words unindifferent to eco-problems	Worry about their comfort
	Ready to pay more for eco-product	Ready to pay small amount of money for eco-product	Ready to pay more if it raises their social status
	The smallest group	Middle group	The biggest group

Price, as basic instrument of 4P, is represented by:

- special offers with presents upon eco-products purchase;
- discounts foreseen due to quick spoilage of eco-products;
- loyalty program, which are to display social responsibility of producer, for example, making of bonus scheme for eco-products purchase by wholesale and retail trade stores.

Place. It is necessary to consider peculiarities of eco-product, in other words to make convenient and understandable placement of the product. Thus, it is rational to separate eco-products in one place with the help of shopboards, different storage stands or in special store for organic products. Stimulation of dealers is also

very important issue, for example employee-consultants in retail trade stores of construction materials or food products.

Promotion. Eco-products became very popular in recent years, that formed a fashion tendency of healthy way of life, that is why most of eco-product costumers want to conform their environment, society as a whole and its established values. Taking into account classification of eco-product costumers we can define the following promotion instruments for every group of costumers in Table 1.

Table 3 – Promotion instruments on the basis of classification of costumers

Costumers	**Dark green**	**Light green**	**Grey-green**
Stimulation method	Baby foods	Safety of life	Social status

Formation of eco-marketing is important for every company, but it is to be controlled by International standards for ecologically harmless development of future and the society as a whole.

USING A MATHEMATICAL MODEL TO EVALUATE THE ECONOMIC AND ENVIRONMENTAL DAMAGE CAUSED BY THE FLOODING

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There are destroyed materials of underground communications; swampy areas, inundation of underground facilities of industrial and residential buildings as a result of flooding process. This leads to emergence of mosquito, development of fungi, toxic fumes in the air that adversely affects the health of the population and leads to significant material losses. Moreover, accidents of the sewer systems and increased infiltration from the surface have led to significant contamination of the upper horizons of groundwater, reduction of drinking and household water reserves.

Created mathematical model allows to evaluate groundwater level changing process and the process of flooding development of the urban territories to consider the credit and debit of the water balance of groundwater. On the data of groundwater level changing it is possible to evaluate future environmental and economic damage caused by flooding process.

We are accepting the following conditions for the mathematical model calculation (Fig.1.):

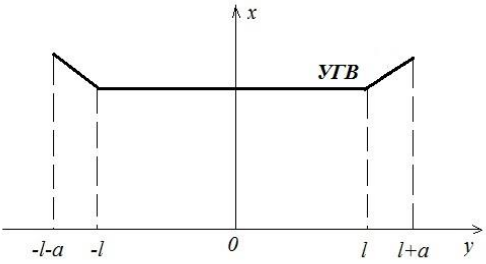

Figure. 1. Symmetric model of the groundwater level changing

The case of a flat filtration has been considered in the paper.

Filtration pressure equation:

$$\frac{\partial^2 h}{\partial x^2} + \gamma^2 \frac{\partial^2 h}{\partial y^2} = 0$$

The lateral inflow and outflow are equal have been accepting in the paper because of performing of the modeling process for small areas of urban territory (industrial objects, buildings etc.).

$$\left.\frac{\partial h}{\partial y}\right|_{l+a,-l-a} = 0 \begin{cases} \left.\frac{\partial h}{\partial y}\right|_{x=l+a} = 0 \\ \left.\frac{\partial h}{\partial y}\right|_{x=-l-a} = 0 \end{cases}$$

The initial level is taken as the starting point, $h=0$:

$$h\Big|_{x=0} = 0$$

There is no infiltration, water withdrawals, transpiration and evaporation processes at a distance $-l \div 0$ and $0 \div l$, because of pavement in this area of territory:

$$\left.\frac{\partial h}{\partial x}\right|_{-l \le x \le l} = 0$$

Infiltration, water withdrawals, transpiration and evaporation processes are occur at the distance a:

$\left.\frac{\partial h}{\partial n}\right|_{l \le y \le l+a} = f_1 + s_1 - g_1 - d_1 - k_1$, где f_1 – the function of additional infiltration to groundwater; s_1 – function of precipitation; g_1 – function of transpiration; d_1 – function of evaporation; k_1 – function of water withdrawals.

The future treatment will be concerned on analytical solution of differential equation and implementation on the specific objects for obtaining real results of groundwater level changing and evaluation of prevented environmental and economic damage.

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CYCLING POPULARITY – DOES IT HAVE A REAL IMPACTT ON THE ENVIRONMENT?

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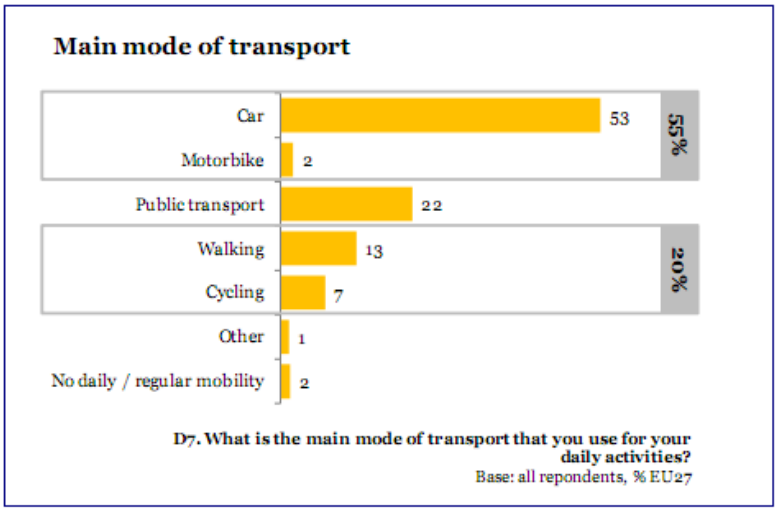
Transport as a one of the most important branches of the economy, every year, consumes a loads of energy. It refers to the passenger transport and the transport of goods. There is a strong role of local governments across the Europe to decrease the impact of the passenger transport on the environment. This goal has been achieving by bottom up model of governance. Shortly, the bottom up model is defined as a strong influence of local society on the decision making. Usually the local policy on sustainable transport aims to promote the cycling as an environmental friendly mode of transport, instead of the car traffic. Across the Europe we can identify “Cycling Cities” – cities where cycling policy has been implemented successfully, and where the society rather use bikes than car modes to move within the city. But does it have a real impact on the environment?

"The Future of Transport Analitical Report" from 2011, shows the situation on the roads per country. The document is based on the survey with people. Authors collected some important data about the rate of people who use the bikes, cars, public transport as a mode of everyday movement. Basic data from the report are attached below:



Source: European Commision, Future of Transport Analytical Report, Flash Eurobarometer, March 2011

This thesis pays more attention to cycling and to using car. There are two hypothesis to validate:

1.Higher rate of cycling results in lower environment pollution;

2. Lower rate of car modes results in lower environment pollution.

Using the classical statistic methods we can see how the European Union is divided by the rate of cycling in the country. The most popular indicator to analyse the dispersion is a standard deviation. It will show how different is the cycling approach within the European Union. The average percentage rate of cyclist was 7,89%, the standard deviation was at the level 7,09%. V indicator (relation the Standard deviation to the average achieved 90% - very high level. It shows how The European Union is different internally in this field. Using the some modern methods of spatial analysis, we are able to join the rate of cycling and a rate of car modes and classify them from the best (less driving and more cycling) to the worst (less cycling, more driving). Using the synthetic indicator we can classify the countries by final energy consumption in transport per inhabitants and the total greenhouse gas emissions per inhabitant, as well.

	Ranking 1	Ranking 2
Cyprus	27	23
Malta	26	6
Ireland	25	24
Luxembourg	24	27
France	23	12
United Kingdom	22	13
Portugal	21	5
Slovenia	20	14
Spain	19	9
Greece	18	16
Bulgaria	17	7
Italy	16	11
Austria	15	17
Lithuania	14	3
Estonia	13	26
Romania	12	1
Finland	11	25
Czech Republic	10	22
Germany	8	19
Belgium	9	20
Poland	7	15
Latvia	6	2
Slovakia	5	8
Denmark	4	18
Sweden	3	10
Hungary	2	4
Netherlands	1	21

The synthetic indicator is based on the Euclidean distance, defined by the equation: $d_i = \sqrt{\frac{1}{m}\sum_{j=1}^{m}(z_{ij} - z_{0j})^2}$ It allows to build 2 rankings: First ranking: level of sustainability – by the rate of sustainable modes and rate of car modes, while the high rate of cycling is a stimulant and high rate of car modes is a destimulant. Second ranking: the level of the pollution.

Then, using the Spearman indicator –

$$r = \frac{6\sum_{i=1}^{n} d_i^2}{n(n^2-1)},$$

the correlation between ranks has been defined. S=0,14. The correlation is positive. Therefore the mode of the transport have an impact on the environment. Scenario Less Cars and More cycling has a positive influence on the air quality. However this impact is very low and we cannot say that the cycling policy strongly influence the quality of the environment. However, the strong dispersions within Europe, could be a reason of such an ineffective impact of the cycling popularity on the environment, because the air is not staying in the one place.

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ENVIRONMENTAL SAFETY AND ENERGY EFFICIENCY AS A PRIORITY OF JAPANESE ENERGETICS

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By the state and structure of electricity generation capacity, it can be judged which stages of formation were passed by Japanese power industry under the influence of national energy policy. The result of world's energy crisis in 1970s was the restructuring of the thermal power industry in Japan to its diversification. Since the "oil shocks" the share of oil in electricity production decreased consistently – from 73.2% in 1973 to 5.16% in 2011 [2]. At the same time capacities of thermal power plants using oil had not been taken out of operation but had not been modernized, remaining a reliable reserve for unforeseen failures in other segments of the electric power industry: Japanese power companies periodically have to resort to additional combustion of oil in case of any problems at nuclear power plants (NPP).

Despite the large amount of gross primary energy consumption, Japan's economy is one of the least energy-intensive. In 2011, the energy intensity of gross domestic product was 0.11 kg of oil equivalent (KOE) per $1of real purchasing power parity (PPP) compared to the world average indicator of 0.19 kg KOE/$ PPP. The increased attention to energy efficiency is the result not only of the propensity to "lean production", but also a deep energy scarcity of Japanese

economy. Domestic production of oil is in a rudimentary form, the annual production of natural gas does not exceed 4 billion m^3, coal – 1.4 million tones. Japan has to import almost all of the consumed fuel resources that caused the active development of Japan's nuclear and hydro generation. Today, with the help of "peaceful atom", country provides about 26% of its total electricity production. Dependent on changes in natural conditions, the annual hydro generation varies in a wide range from 74 to 95 billion kW•h, taking up about 2.3% of world production [3].

Renewable energy sources (RES) have an active development in Japan. Already in 2008, their share reached 11.8% in the total production of primary energy sources in the country. Solar, geothermal and wind power has the greatest development. According to the "Japan Strategy of Biomass", adopted in 2002, this area of RES is among the priority. In 2011, the installed capacity of solar power plants (SPP) in Japan was 4.914 GW. According to this indicator, the country ranked third in the world, second only to Germany and Spain. The largest SPP of Japan is "Solar Ark", which produces 0.5 million kW•h/year. In 2010, the total installed capacity of wind power plants of the country was 2.5 GW. Today the installed capacity of 6 geothermal power plants (GPP) is 0.53 GW. Currently under construction there are 5 GPP [1-2]. In Japan there is a continuous search of other unconventional sources of energy. In particular, in 2006 the municipality of Muroran mastered the production of methane from the snow. According to Japanese scientists' estimates, in the industrialized cities the content of gas in the snow is 70%, as the snow absorbs not only dust, but also harmful gases. According to the estimates, from 1 ton of snow it can be collected up to 100 liters of methane [3].

One of the priorities of national energy policy is to ensure environmental safety. Over the past decades, Japan is one of the leading countries in CO_2 emissions, produced 3.77% of global emissions in 2011. In the pre-crisis period (as of 2008) the volume of greenhouse gas emissions (GGE) in Japan reached 1.38 billion tones of CO_2-equivalent, including 1.2 billion tones in the power sector. In 1997 Japan signed the Kyoto Protocol and assumed commitments to reduce GGE by 6% from the 1990 level (1.16 billion tones of CO_2-equivalent) in 2012, but until 2003 GGE demonstrated the sustainable growth. Only since 2004, they have stabilized at 1378...1396 million tones of CO_2-equivalent, which exceeds level of 1990 by more than 18%. Addressing this issue, there was adopted "Act of rational use of energy" developed by Agency of Natural Resources and Energy of Japan [3].

In May 2007, the Japanese government adopted the initiative CoolEarth 50, according to which it is planned to reduce greenhouse gas emissions by 50% in 2050 compared to the 1990 level. To implement this initiative, in March 2008 there was designed Cool Earth – Innovative Energy Technology Plan, which determined the priority of innovative energy technologies, represented the road maps of new

technologies, ways of increasing energy efficiency and cost savings, as well as a list of measures of international cooperation for improving the exchange of information and technological developments in the field.

Japan has faults with affordable electricity after decommissioning of 50 nuclear reactors as a result of the accident at NPP "Fukusima-1" in March 2011, which caused local ecological disaster after a powerful tsunami hit on Japanese coast. In this regard, the country introduced the regime of austerity of electricity. Period of lowered consumption acted from 9.00 am to 20.00. Because of rolling blackouts of electricity introduced in various country parts, the level of consumption was reduced by 5-15% compared to the summer of 2010. Restrictions are not touched upon Tokyo, Okinawa and the north-east of Honshu, where there was sufficient capacity for electricity generation. Enterprises and offices without fail disable or reduce lighting, put air conditioners at mark not less than plus 28 degrees Celsius. In May 2011, Japan passed a law requiring citizens to save energy by 15%. Thus, despite serious accidents in 2011 that rocked the country's energy system, Japan continues the consistent implementation of energy efficiency policies and environmental safety by securing them as priorities for further development.

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AGRICULTURAL PURPOSE LANDS

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Importance of an ecological component in system of balanced use of the lands of agricultural purpose acquires every year the increasing urgency in connection

with prevalence of private economic interests of many agricultural manufacturers over public, focused on is social-ecological needs. The ecodestructive processes in agricultural use of the land resources, connected with ignoring of the reproduced processes and desire to get whenever possible the big profit on the land, have received regular and comprehensive character which without fail will lead to nation-wide ecological crisis in our country.

For last two decades in connection with excessive plowed land, insufficient entering of organic substances, mineral fertilizers, meliorative substance, pollution, etc. lands of the country regularly degrade. In Ukraine, annual losses of a ground constitute about 600 million tons. The area of degraded lands annually increases on 80 thousand in hectare. Almost every third hectare (30,7 %) is eroded, and every second - on dangerous to be degraded [3]. One of important agrochemical indicators of land fertility is humus which accumulating in a ground is an indispensable condition of restoration and fertility increase. Nevertheless, last years under modern conditions of managing annual losses of humus represent: to Polissya - 600-700 kg/hectares, in Forest-steppe - 500-600, Steppes - 500-600, as a whole across Ukraine - about 600 kg of humus on hectare [1].

The ecological situation in territories appreciably influences an agroecological condition of a ground cover and other components of agricultural landscapes. Behind modern representation the term "an ecological condition of a ground" have to understand as an integrated indicator of its ecological stability, fertility and pollution level.

The estimation of influence of a components of grounds on ecological stability of the territory, which stability depends from agricultural using of the lands, plowed and intensity of use of lands, carrying out meliorative and other technical works, territory building, is characterised by coefficient of ecological stability.

Behind I.Ritorski and E.Gojke's calculations, the coefficient of ecological stability of separate grounds represents: the built up territory and roads - 0,00; an arable lands - 0,14; wood strips - 0,38; orchards, bushes - 0,43; gardens - 0,50; meadows - 0,62; pastures - 0,68; lakes and bogs of a natural origin - 0,79; woods of a natural origin - 1,00 [2].

At a different components of grounds the coefficient of ecological stability of land-tenure territory (K_{es}) calculates behind the formula (1) [2]:

$$K_{es} = \frac{\sum K_i P_i}{\sum P_i} K_p, \qquad (1)$$

Where P_i – the area of i-kind lands; K_i - coefficient of ecological stability of i-kind lands; K_r – coefficient of morphological stability of a relief (1,0 for stable territories and 0,7 for non-stable territories). For calculations it is accepted, that $K_r=1,0$.

If the received value of K_{es} is less 0,33, land-enure is ecologically non-stable if changes from 0,34 to 0,50 concerns to stably unsustainable, if is in limits from

0,51 to 0,66 passes in a components of average stability, if exceeds 0,67 the land-tenure territory is ecologically stable.

On the basis of the this method, the coefficient of ecological stability of Ukrainian regions in 2011 (fig. 1) is calculated.

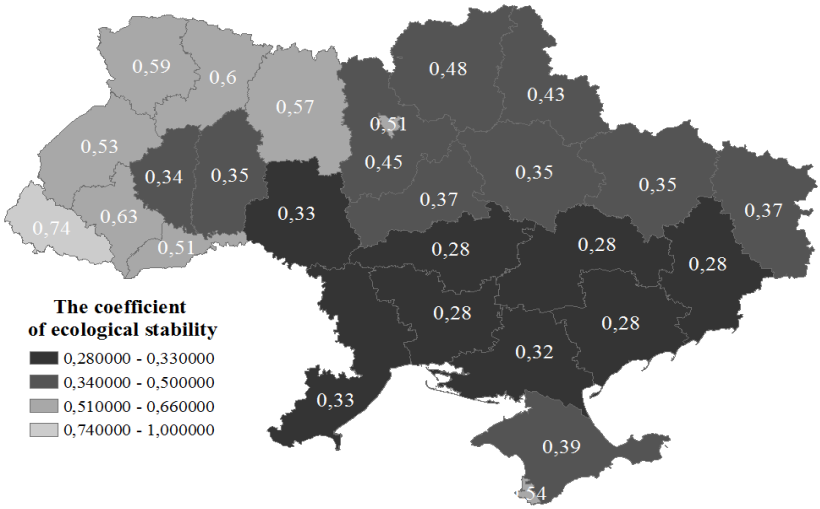

Figure 1. The calculated ecological indicators of equation of the territorial organisation behind regions in 2011.

So, the majority of regions of Ukraine concern ecologically non-stable or stably unsustainable categories of the lands and only 6 western areas are average stable. The Zakarpathian area is one ecologically stable region in Ukraine, that speaks low quantity of arable lands and the considerable area natural woods territories. The lowest level of ecological stability is observed in the central and east regions - Donetsk, Dnipropetrovsk, Zaporizhya, Kirovograd, Mikolaiv areas. On the average across Ukraine the coefficient of ecological stability constitutes 0,40, that as a whole characterises territory of our state as ecologically non-stable.

Thus, the question of protection of agricultural purpose lands in the conditions of an aggravation of an ecological situation in Ukraine should become one of the major directions of a state policy as improvement of a condition of the lands opens considerable reserves of a growth in volumes of agricultural production and provides essential improvement of ecological living conditions of the person.

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CULTURAL AND EDUCATIONAL BACKGROUND OF FORMATION OF SUSTAINABLE LIFESTYLE

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In the XXI century mankind has approached the global transformation of society, which resulted in creation of a qualitatively new socioeconomic system, which is the knowledge society and the informational society, the foundation of which is the "economy of knowledge." Since the main factor in the formation and development of the "economy of knowledge" is human capital, need for a permanent way of human life gains currency more and more. That is, a way of life, which will provide the usage of the human capital (knowledge and skills) to meet the diverse needs of people who are not putting the state at risk of social, economic and ecological systems of society.

The main key areas of human consumption, in which efforts should be focused to change the way of life are water, energy and transport usage, foodstuffs consumption. Besides that it is established that such factors as the ethics and culture of the population, public education, public health, social welfare, incomings, production capacity in the region, foreign on the formation of a permanent way of life influence economic and investment opportunities, entrepreneurial activity, the impact on the ecosystem, participation in the environmental projects, environmental capacity of products. Also one of the factors that affects on the formation of a permanent way of life is increase of the ecological consciousness of the population and the formation of an ethical approach to the environment through the development of environmental education, raising the culture level and education of the people

Human's invasion to the biosphere system of the autoregulation, which was formed during the evolution of the planet for millions of years, requires special knowledge, prudence, foresight, and high predictive capabilities of science, which guarantee the safety of the biosphere. Therefore, further development of

environmental education and training, increasing of its theoretical level is one of the urgent tasks of mankind.

Currently, the ecological education is the result of the interaction of three main educational factors such as families, schools and the media. It is impossible to solve the problem of continuous ecological education without such unity.

To solve the problem of ecological education is more difficult than to improve the system of ecological education. This process is not only a body of knowledge about the features of the interaction between society and nature, but it also covers a wide range of different human qualities and characteristics identified outlook and attitude, moral, legal, environmental, social principles and standards. The result of the ecological education is the establishment of environmental identity, which is peculiar to ecocentric type of environmental consciousness.

In general we can say that increasing of ecological awareness and the formation of an ethical approach to the environment is a primitive element in the formation of a permanent way of life. If people in their daily activities not only learn the environmental information, but also form on its basis own moral principles and norms, then the institutions of control for ecopropitious behavior will play a secondary role in society. In addition, environment awareness as part of the public consciousness answers to the principle of sustainable development, which relates to the preservation of peace for future generations, providing them the knowledge and understanding of the need to preserve all life on Earth.

Implementation tools. Improving the level of ecological education at pre-school, school, university and postgraduate levels.

The main goal of ecological education is the formation of the younger generation an appropriate attitude to nature as the main acquisition based on morality and international law.

The main areas of improvement of ecological education are providing the training of teachers of ecology and environment advisers for schools with the purpose to learn new methods of teaching environmental protection, the development of the concept of ecological education, which provides the appropriate interprogram comprisal both local and global environmental issues, support local activities in the sector of environmental and ecological education through the provision of information, materials and equipment for the nature protection and ecological education, the introduction to the section "Introduction to the nature" of the program of education and learning in kindergarten elements of environmental education for pre-school children, the development of extra-curricular activities in the industry environmental education in different forms of organization: the work and rest camp, ecological camps, field environmental workshops, environmental school's clubs and associations for the interest, introduction of environmental issues to the graduation work of alumnuses of vocational schools, universities and colleges; development of curricula,

textbooks and teaching aids on environmental issues and their implementation in the classroom.

Summing up, it should be noted that the problem of formation of a permanent way of human life is inseparably connected with cultural and educational upbringing of the present generation. The main instrument to achieve the necessary level of culture and education of the people is the development of ecological education at the local, national and international levels.

ALOE VERA: THE GREEN GOLD AMONGST US

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Eritrea is a country located in the arid, semi arid and mountainous parts of east Africa. During the past times, the merciless cutting and destruction of forest resources in Eritrea have resulted in environmental degradation and expansion of desertification. Land is exposed to erosion and the fertile part of the soil has been depleted. To combat this alarming situation and having realized the precarious conditions of the environment different sectors of government have been involving in various activities.

As a strategy, planting multipurpose species would be advisable considering the assurance of growth in production and environmental sustainability. Among them is a species known as Aloe, that has been demonstrated its multipurpose and cultivated for centuries. Most Aloes have some medicinal or commercial value, but it is the *Aloe Barbadensis Miller (Aloe vera* or "true Aloe") plant which has been of most use to mankind because of its multiple benefits.

Aloe vera (Aloe barbadensis Miller) is a perennial, species of Aloe, native to Northern Africa. Cultivation of *Aloe vera* has a multiple objectives that include Health benefits, productive and social welfare benefits, soil and water conservation, environmental Provision and Tourism. It is one of the most versatile plants in the surface of the Earth. This species is now popular both with modern gardeners and commercial farmers. Although *Aloe vera* is simple to grow, it is best if we follow specific scientific recommendations.

In Eritrea *Aloe vera* is a native crop that grows naturally in most parts of the country. Eritrea has the right climatic conditions, diverse ecology, an arable land and concerned government sectors to carry out successful *Aloe vera* plantation. The *Aloe vera* can be cultivateds in hillsides and mountains, around coastal areas, in community closures and in modern farms. If we effectively utilize this plant we will be one of the greatest producers in the regional and international markets where the demand is sky rocketing.

The primary objective of this paper is to introduce and increase awareness of the population on the wonders of *Aloe vera*, and future proposals on what should be done to get the maximum payback of the plant.

One other objective might be Eritrea, a country that has been damaged by long term colonialism, war for independence and natural problems. This paper is a contribution: in addition to the promise held by the people and the government of Eritrea to heal this damage.

The other objectives is

✓ Reducing poverty by supporting value chain development of *Aloe vera* products which have a potential "economies of scale" for increased income and employment opportunities

✓ Ensuring practice of sustainable forest management by promoting resource conservation that uses incentives (cash in kind) to influence environmental services through a concept of Pro Poor Payment for Environment Services

✓ To expose farmers to *Aloe vera* farming and its value addition for income generating and poverty alleviation within the semi arid lands and to determine the *Aloe vera* species that are most adaptable for growing in the semi arid lands and their fertilizer and manure requirements for commercial production.

THE ROLE OF AUTOMOTIVE LEASING IN THE ERA OF GREEN SOLUTIONS

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Electric cars were invented in the late 19th century. In 1899 the "Jamais Contente" driven by Belgian Camille Jenatzy was the first electric car to have broken the 100 km/h barrier. In 2012 in the EU countries the structure of the new cars sales portfolio according to the type of powertrain was the following: petrol cars ─ 43%, diesel cars ─ 55%, hybrid cars ─ 1,1%, plug-in-hybrid cars ─ 0,05% and electric cars ─ 0,2%. Despite the low share of electric cars in the total car distribution in the European countries, in 2012 their sales increased approximately by 50% in comparison with 2011. Nowadays France, Norway, Germany and Great Britain are the countries with the biggest interest to electric vehicles ─ nearly 80% of electric cars sales [1].

There are certain benefits and problems of electric cars use:

an electric car does not release any polluting emissions directly on site;

its driving enjoyment (smooth running, sound insulation) is highly significant for everyday use;

the running costs for electric cars are lower than those of comparable combustion vehicles.

Drivers of the electric vehicles pay the minimum rate of the road tax (e.g., 5% ─ in Finland) or could be exempt from the annual circulation tax's payment (e.g., in Germany ─ for a period of five years from the date of car's first registration). In Czech Republic electric are exempt from the road tax (this tax applies to cars used for business purposes only). In Denmark only electric vehicles weighing less than 2,000 kg are exempt from the registration tax [2].

Despite the electric vehicles' potential benefits, widespread adoption of electric cars faces one significant problem. As of 2013, electric cars are significantly more expensive than conventional internal combustion engine vehicles and hybrid electric vehicles due to the additional cost of their lithium-ion battery pack. However, battery prices are coming down with mass production and are expected to drop further. In the nearest future fuel efficiency and environmental friendliness will be the most important car product issues.

Nowadays not only in market economy countries, but also in emerging markets, incl. Ukraine many companies use leasing to finance their transport needs. Leaseurope's survey of the European leasing market development in 2012 showed that vehicle leasing volumes rose by 3,5% compared to the year before [3]. This sector's performance is especially noteworthy when considering that in 2012 total leasing volumes in the European countries reduced by 1%. Despite the difficult economic conditions, vehicle leasing is clearly an attractive proposition. As for example in Ukraine during many years nearly 60% of the total leasing portfolio makes transport leasing [4].

For a fixed monthly payment, clients get the use of a car or a van for an agreed duration and mileage that suits their business. Clients can also ask their leasing company to take care of nearly every difficulty associated with car and van ownership, be it maintenance, servicing or replacement vehicles. In many countries there are tax benefits for those companies who use finance leasing. For example in Ukraine the national legislation allows lessees in case of finance leasing to consider lease payments as total costs, decline their tax basis by amortization and free themselves from the value added tax.

Furthermore, leasing also eliminates any concerns about what the vehicle is worth at the end of the agreement. As long as they have not exceeded the contracted mileage and the vehicle is in a fair condition, it is returned at the end of the contract, with no additional cost. But in case of financial leasing it can be also purchased by lessee.

In the European countries it's more popular to lease a passenger car. For example in 2012 the share of passengers' cars in new automotive leasing volume was 72% to 28% of commercial vehicles [3]. According to Leaseurope's estimates almost 32% of new cars across Europe are provided via leasing companies. This means the industry is ideally positioned to help phase out heavily polluting cars

and encourage the uptake of cleaner and more fuel efficient ─ as for example, electric vehicles. In the UK for instance, the average newly registered lease car has 6-7% lower emissions than the average for all cars sold [3].

While the share of hybrids in leased fleets is steadily increasing, the same cannot be said for full electric vehicles. Overall sales volumes remain extremely low for these types of cars and, even in countries where they are exempt from purchase taxes. Unfortunately lack of an adequate charging infrastructure, performance in bad weather conditions, as well as uncertainty surrounding residual values are contributing to this situation.

In conclusion, it would appear that the successful uptake of clean and energy efficient vehicles in leased fleets, as well as in overall car fleets, is dependent in equal measures on vehicle taxation, incentives for vehicle purchases and, more importantly, for lifetime utilisation, fuel and maintenance costs, agreement on charging standards, as well as differences in regional and economic development.

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ADVANCED ANALYTICS AS A TOOL TO IDENTIFY WAYS TO ACHIEVE SUSTAINABLE DEVELOPMENT

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At this stage of information society is a rational mechanism for the achievement of sustainable development through the use of management information systems. Advanced Analytic System allows "deep" data mining, forecasting and optimization decision making.

To solve the problem of analysing the social and economic development, advanced analytics system can be modelled several scenarios of sequence analysis. In this way, you can handle not one but two or more models for the region. To show the results can be achieved with different tools of visualization:

- ✓ reports;
- ✓ OLAP-views;
- ✓ graphics;
- ✓ charts;
- ✓ GIS components to display the results on a map.

At the moment, there are many different models of sustainable development of the region.

The main steps of the analysis are:

1) formulation Goals of the study;
2) construction of Scenario - the model situation development;
3) simulation and visualization of the Scenario;
4) evaluation the received data using a variety of methods and tools to identify trends in the development of the situation and / or deviations from desirable parameters (pattern matching);
5) formulation possible recommendations to the decision-making official (DMP).

One model is a particular subject area. The main elements of the model are the entities and relationships between them. Relationship at the same time can be divided into:

- ✓ mathematical (one object is the result of the calculation using other objects or specific values);
- ✓ logical (such relationships can be determined using the appropriate statistical methods and by an expert).

Such a representation of the studied model provides the ability to change, delete or add elements of the model without destroying the overall model.

The use of computer data processing systems can construct complete model of the system and its development. This is the way you can improve the process of achieving sustainable development. If you change the goal of modelling,

modification of the model will not take the time and numerous resources and analytical components of the system will change the scenario to achieve this goal.

THE EXPERIENCE OF THE USING OF INTERACTIVE METHODS FOR STUDY OF ECONOMIC UNDERSTANDING OF ENVIRONMENTAL PROBLEMS AMONG STUDENTS-ECOLOGISTS

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The peculiarity of disciplines dealing with the problem of managing organizational systems is the impossibility of presenting the full scope of the required knowledge in the form of theoretical propositions. One way to address this issue is to implement in the classroom interactive teaching methods, such as the method of case studies and tasks in the form of case studies. Case method is a method of Post-classical methodology of teaching which is highly methodological saturation, it allows to develop significant amounts of knowledge, generate professional quality of training students of Environmental Management has certain sectoral characteristics that must be considered as the development of traditional teaching methods (lectures, seminars), and during the use of interactive methods. It is also necessary to distinguish between the tasks of disciplines "Managing the environmental activities" and "Environmental Management and Auditing." In the first case, we consider the problem of public environmental institutions, in the second peculiarities of enterprises and mechanisms to resolve environmental problems of these enterprises. The main problem here is the fact that while studying students-ecologists don't formed business and economic approach in solving ecological problems of enterprises. They are perfectly informed about the environmental processes, patterns and volumes of emissions and discharges of pollutants, but it is difficult to develop optimal ecological and economic solutions to these problems.

The Department of Ecology of Cherkassy State Technological University developed and implemented in the learning process a number of case studies for the course "Environmental Management and Auditing." They relate to environmental issues enterprises of different industries. In particular, the sub-topics: organizational structure of enterprises (local environmental departments in the total structure of the company, responsibilities and subordination of ecologists in the management system of staff), methods of decision-making (eg, methods of collecting information during the decision-making when choosing eco-saving technologies) are observed. A special attention is paid to the learning objectives of case studies. They can be divided into three categories: the development of

professional skills and knowledge, increasing the volume and improving the quality of learning, the formation of attitudes. The developed comprehensive set of documents makes the students to work in that aspect.

At first the developed situational exercises were offered a group of 30 people. A group of students was divided into five subgroups of 5 students. Each group offered case studies on environmental issues in enterprises of different industries in Cherkassy region. The characteristic external and internal environment, SWOT-analysis data for each plant, reports on emissions and discharges of pollutants, especially during the process of production, characteristics of equipment were given in situational exercises. Students were asked to decide which environmental problems inherent in each of the enterprises and determine the priority and solutions to these problems.

Solving situational tasks of environmental management showed dependence in making decisions concerning suggested situations by students from their psychological characteristics and practical experience. Among the proposed variants of the solution of environmental problems in the enterprise clearly monitored the style that has characterized each of the students psychologically: tough, authoritarian - 60% liberal - 15% democratic - 25% of all students. The predominance of authoritarian style may also be explained by ecological thinking of students as priority in solving environmental problems is still they prevail over the understanding of difficulty of the economic situation in enterprises.

Interactive learning method requires a certain improvisations from both the teacher and the students. We can say that situational exercise is a skeleton set of educational problems, and everything else being completed directly in class. The perspectivity of the method consists in the fact that when students are thinking over the situation, then delve into it at the same time realize the complexity and diversity of solving human problems realities of life.

There is a need for further development and implementation of training students-ecologists interactive teaching methods that combine economic and environmental problems of environmental management with maximum use of training and solving case studies and case studies. So it is possible to develop in ecologically thinking students understanding of the need to look for such solutions to environmental problems, which would allow to achieve a balance between economic objectives and environmental management. And this is the first priority of environmental management.

PRESSURE OF TOURISM ON ENVIRONMENT

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The Original fashion is on rest in rural locality which acquires force in Europe the last years, reached to Ukraine. Under rural tourism mean and «green» (rest to 1-2 days, gathering berries, mushrooms, relaxing on the beach and others like that), and environmental (when tourists simply look after by nature), and agrotourism (during the rest can take part in collection of fruit, vegetables, supervision of animals).

There are about 6.5 million private houses in ukrainian villages. The sixth part of these estates are locate in the scenic, historic, clean places where townspeople prefer to escape from the city bustle and caring. But while this niche of tourism business is not too demand in our country. Today, development of rural tourism has spread to 14 regions of Ukraine, particularly in the Carpathian Mountains, the western areas, Crimea, Polessya and Tail. According to the Association to promote the development of rural tourism in the Carpathians are more than 60% of farmers who adopt «green» tourists [1].

Having the settled house, farmers may fully or partially donate its townspeople during their holidays or vacations. Tourists are also provide food and acquaint with local sights. Such rest treats are considerable cheaper than journeys at a sea or abroad. Therefore, rural tourism is designed on home city-dwellers that do not have finances for more expensive rest, and also for foreigners who want to experience of the Ukrainian rural exotic things. Profitable it and to the peasants, because it gives them the opportunity to earn.

Researchers believe that the successful development of rural tourism area should have the following features [2]:

- ✓ clean environment;
- ✓ low level of urbanization and industrialization;
- ✓ limited intensity of agricultural and forest products;
- ✓ favorable agricultural structure (average farm size);
- ✓ a harmonious agricultural landscape;
- ✓ low-income of people (that would encourage their employment in this field);
- ✓ the free resources of apartments.

We should not forget that tourism, including «green» and ecological, and an agrotourism is a not zero-emission production. It can cause contamination areas, overpopulation, depletion of natural and cultural resources, pollution of water, degradation of land and other negative consequences.

In the project of Law of Ukraine «About rural and rural green tourism» (article 15) [3] specified on the duties of rural owners in relation to the acceptance of measures from a guard and environmental preservation, namely:

✓ SPREAD AMONG TOURISTS OF INFORMATION ABOUT RULES ECOLOGICALLY SAFE BEHAVIOR;

✓ PREVENTION OF APPEARANCE OF TRASHES BY ESTABLISHMENT OF THE SPECIAL CONTAINERS FOR GARBAGE ALONG TOURIST ROUTES;

✓ SPECIAL SIGNS MARKING PLACES FOR COLLECTING HOUSEHOLD WASTE;

✓ REALIZATION OF OTHER EVENTS IS ENVIRONMENTAL PRESERVATION.

Therefore, based on the development of rural green tourism should be implemented in following environmental principles aimed at protecting the environment and preserving the environment:

✓ minimization of influence is in the process of tourist activity on the state of the landed and water resources, atmospheric air;

✓ responsibility of owners of «green farmsteads» is for the state of territories before local communities;

✓ an ecological supervision is on the state of the tourist mastering of territory from the side of municipal communities, proprietors of farmsteads and by administration of settlements;

✓ tourist infrastructure must not violate historically formed environment and the uniqueness of each area;

✓ a social justice is in relation to local communities (a profit and other blessing from this type of activity must be distributed on parity principles, taking into account interests of local population; because Constitution of Ukraine provides fundamental bases of right of ownership on natural resources (and recreational including): people of Ukraine are a proprietor, however on behalf of people public and local self-government authorities are carried out a competence).

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