



# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ACCOUNTING, FINANCE AND MANAGEMENT SCIENCES



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To Link this Article: <http://dx.doi.org/10.6007/IJARAFMS/v1-i1/9808> DOI:10.6007/IJARAFMS /v1-i1/9808

**Received:** 17 January 2011, **Revised:** 11 February 2011, **Accepted:** 26 February 2011

**Published Online:** 19 March 2011

**In-Text Citation:** (Gresoi & Gheorghe, 2011)

**To Cite this Article:** Gresoi, S. G., & Gheorghe, A. (2011). Interdependencies Between Sustainable Development and Ecology. *International Journal of Academic Research in Accounting Finance and Management Sciences*, 1(1), 31–39.

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Vol. 1, No. 1, 2011, Pg. 31 - 39

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## Interdependencies Between Sustainable Development and Ecology

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### Abstract

This study proposes to analyze the close connection between sustainable development, ecology and coming back to tradition. In order to do so, a solution is given to the ecology implementation and to the sustainable development through Romanian traditions. Even though humankind has always been subjected to nature, living according to it and almost always losing when facing a direct confrontation, lately, due to scientific and technical development, man has succeeded in winning some battles with nature and to subjugate it.

**Keywords:** Ecology, Sustainable Development, Knowledge, Tradition.

### Introduction

Although the most progressed being, endowed with reason, human being needs to have continuous relations with the environment in order to survive. These relations have many negative implications for nature and thus, the reason of humankind does not always help proving the superiority of the humankind, producing more bad than good. We can take into consideration radioactivity, toxic substances, massive deforestation, and climate changes. Therefore, once these phenomena started appearing more often, ecology became a primary science for the sustainable development.

Due to these causes, we can say that in order to ensure the continuity of life on Terra, it is necessary to give special attention to ecology and knowledge of traditional ecology, which may be considered one of the best methods of returning to a healthy lifestyle and environment. Basically, the solution for these issues is to adopt traditional elements to the current lifestyle and re-establishing harmony between humankind and nature.

### Sustainable Development and the Ecology

Sustainable development may be defined as a total process of the human societies and their territorial support that permits the achievement of human and natural potential, in various natural environments and social-economical and political conditions.

The phrase „sustainable development” became popular at the end of the '80s. In 1987 there was drawn up a Brundtland Report within ONU, which presented the results of a study commission presided by Gro Harlem

Brundtland, the prime minister of Norway. This document, known as „Our Common Future” had and continues to have an important orientative function.

There were other reports, such as: „The limits to growth” – Professor Dennis Meadows; „Mankind at crossroads” – coordinated by M. Mesarovici and E. Pastel; „Beyond the age of waste” – Dennis Gabor and Umberto Colombo, and also an annual report entitled „State of the World” of World Watch Institute.

Development is a multi-dimensional concept that asserts a succession process, of performance within space and time of phenomena and natural and social processes, being mostly seen as quantitative. The intense, exaggerated economic growth led to serious ecologic unbalances that turned against humankind. Thus, the scope of development is to progress improves the lifestyle quality, giving a new meaning to development which is: sustainable development.

The modern human transformed complex and stable natural ecosystems in simple and unstable systems, destroying a part of them and creating a technosphere, whose wastes interfere with two of the basic function of ecosphere, threatening not only the humankind’s health and welfare, but also endangering the organic world, of which its biological future depends. Besides these effects of development, the increase of the population led to a bigger consumption of non-regenerative resources, which raises the question regarding the survival of the next generations.

Nowadays, there is a permanent conflict between those who support the technological development and the increase of economy and the ones who militate for a sustainable development and insurance of existing conditions for the future generations. Ecology is the best solution regarding the achievement of both objectives, taking into consideration that both are necessary for the modern world.

Gro Harlem Brundtland stated „*we borrow ecological capital from future generations, being aware that we can never give it back*” (Report, 1983). We need a sustainable development in order to ensure the present generations’ fulfillment of needs, without jeopardizing the future generations’ fulfillment of needs.

Ecology is the science that studies the relations of interactions with biosphere, comprising intra- and interspecific relations and the relations with the anorganical lifestyle.

Ever since the 18<sup>th</sup> century it was noticed a preoccupation for scientific knowledge concerning the sphere of interactions within nature, even if, empirically, correlations were made a lot earlier. In 1792, Lavoisier presents the basic idea of matter circulation within nature, and in 1861, Pasteur describes the cycle of decomposition of organical dead matter, important aspects for understanding of the ecological processes.

The ecological idea derives also from Darwin’s thought (1859) about reciprocal dependency between living organisms of a certain species and the number of individuals of the respective species, and also the interaction with other species from the respective area.

Ernest Haeckel, considered the founder of this science, describes ecology as a science that gives us „a unitary perspective upon the living nature with various aspects of the fighting for existence, based on integral and interdisciplinary concepts’. Thus, ecology is the science of „nature economy” or the science about production, communication, transformation, distribution, disposal and degradation of organic matter in ecosystems.

Through the years, the scientific dowery of ecology gradually improved by researching efforts made by science people, including science people from Romania.

Human activity impact on environment had a linear path through the history and gradually became exponential in the last century and thus, such negative impact on environment, according to the known laws of science (chemistry, physics, biology, demography etc) can no longer be controlled. Not paying attention to the environmental factors and to their excessive consumption and the lack of responsibility affect the biodiversity and the environment and endangers people’s lives. That is why; ecology is the science that uses

cumulative information from various domains in order to find explanations and solutions for problems concerning the protection, organization or exploitation of ecosystems and regenerable resources of the biosphere.

Everybody knows that before humankind evolution and before finding solutions to change the environment, nature served as shelter for people and they knew how to cherish and learn from it. Everything changed when technology and anthropic environment appeared and evolved. There are still places where people make efforts not to change the natural environment, but in order to preserve an ecological lifestyle; we need to protect these parts of the world and to adopt customs and traditions for a Romanian lifestyle.

## **Traditional Ecological Elements**

### **Agricultural Ecosystem**

Industrial agriculture was a turning point in the evolution of agriculture and the land cultivation started affecting the balance of Terra.

The agricultural ecosystem is a functional unit of the biosphere, created and controlled by humankind in order to obtain high production of superior quality, in advantageous economic and social conditions (*Bran, Ioan, 2004*).

The basic unit of agricultural ecosystems is the allotment, which is a delimited surface of relatively small dimensions and uniform conditions, on which human sets up biocoenosis.

Agricultural biocoenosis is formed by crop plants, together with all living organisms that exist within the crop area (microorganisms, pests, weeds etc).

In order to ensure a sustainable development in what concerns the agricultural ecosystem, the following proposals are made:

- Taking into consideration the fact that Romanian agriculture is at a very low level of development, funds allocation, that could ensure the quantities of internal consumption and also for export from the primary sector;
- Not to use genetically modified species of plants;
- Not to use chemical fertilizers, but only natural fertilizers;
- To create a series of programs that could attract European funds for an ecological agriculture, so that the price of these products could be smaller and more attractive to the consumers;

To invest in irrigation systems that could permit agriculture practices in good conditions even in drought conditions.

### **Urban Ecosystem**

Urban ecosystems are represented by human settlements, where there are created specific interaction relations between an environment seriously hanged by humankind and the human community (*Bran, Ioan, 2004*).

This area is strongly induced, having allogene elements (buildings, infrastructure, communication paths, products that have hardly degradable packages etc) in order to fulfill various human needs that increase according to the degree of civilization. The urban area extends more and more and becomes an attractive core by its work offer. This phenomenon leads to overpopulation in cities, soil degradation, air degradation and the excessive consumption of resources.

The proposed solutions for ecologization by adopting traditional elements are as it follows:

- Strong development of public transportation in order to reduce the number of vehicles;
- Green spaces development;
- Promoting ecological education;
- Setting up a green space in front of the block of flats should be obligatory;
- Introducing Romanian products on the markets and promoting them;
- Organization, at city margins, of equitation centers, mini-farms, centers with specific Romanian village activities (pottery, weaving, sculpture etc.) in order to preserve and promote the Romanian traditions;
- Implementing ecological norms in industry and setting up of industrial plants at city margins;
- Preserving the historic patrimony of the city;
- Strict sanctions regarding the keeping of the space between buildings in order to preserve a better aeration of the city;
- Subventions allocation for building ecological vehicles.

### **Rural Ecosystem**

Rural ecosystem is formed by rural settlements and the land on which they exercise their influence (agricultural lands, forests, fields, meadows), it is the place where the rhythm of social-economic activities mingles with the natural process rhythm (*Bran, Ioan, 2004*).

Allogene elements from rural ecosystems are less aggressive and their disposal reflects a certain submittal to objective laws of nature. Wastes accumulation has a low level due to the fulfillment of a significant small number of auto consumption needs. Thus, there are not introduced here products with different packages because there are multiple possibilities to exploit the organic household wastes.

Rural ecosystems still have an ecological lifestyle and many of them are promoted as touristic areas due to the fact that many people want to enjoy the customs, tradition and magic of the Romanian village.

We cannot improve the rural environment by ecology because this system is in itself an ecologic one, but we can give advice for its preservation:

- To create a service that weekly collects household waste in order for it to be taken to recycling centers;
- To ensure the hereditability of the customs and traditions and to promote them by means of mass-media;
- To ensure a retail market for the traditional products and also for the natural fruits and vegetables;
- To give subventions from the state for those who develop, within the rural environment, economic activities that promote and preserve Romanian traditions;
- To ensure a main infrastructure for an easy access to the village;
- To ensure a good education for the children.

As we know, life in the country does not only imply the scenery and a non-polluted environment, but a world that survives according to its moral norms, that does not need many products on the shelves of the supermarket because it has many beautiful and fertile gardens and orchards, wheat fields, corn fields, sunflower fields, a yard full of poultry and a cow that grazes next

to them. It does not need a fashion house because it has a sewing machine and it does not need malls because all the things are prepared in the household.

### **Industrial Ecosystem**

The industrial area is an assembly of units for industrial production, means of transport, warehouses, its administration and serving (raw material, water, electrical energy supply etc).

As we cannot refer to it as an industrial ecosystem because is a contradiction in terms, we will refer to it as an eco-industrial park that is represented by enterprises that cooperate in order to exploit the resources by reciprocal recovering of wastes it generates (the waste produced by an enterprise is used as raw material for another enterprise) (*Bran, Ioan, 2004*).

Industry is a development engine and it controlled the national economies during the last century, causing the evolutive process of the contemporaneous society. Being more flexible to organization changes than agriculture, the area of industrial distribution continues to raise issues because it must be analyzed according to the distribution of other elements. We can refer to this area as an integrate area within other ecosystems it influences, being an area occupied by buildings and industrial equipments and its effects are seen on a long term.

In order to solve the issues of this area, ecology concerning issues, the following solutions are brought to the attention:

- It is obligatory to maintain a low level of pollution by introducing air filters that could reduce the quantity of the contaminants released in the atmosphere;
- Systematical valorification of wastes and secondary products, similar to trophic processes in the natural ecosystems where all wastes become resources;
- Adopting alternative sources of electrical energy;
- Making efforts to separate the industrial area from the living area;
- Setting the industrial unit near to the extraction point of the raw materials.

### **Affected Areas and Solutions**

#### **Bucharest**

Bucharest is the capital and the largest city in Romania, with an area of 300 km<sup>2</sup>. It is located on a plain, in the south-east of the country, at approximately 65 km from the Danube River, on the river bank of Dâmbovița.

Bucharest is the most important industrial, financial and commercial centre of Romania. The industrial production of the city comprises: heavy duty vehicles, aircraft, fine mechanisms, agricultural tools; electronic, chemical, textile, cosmetics products and food and represents 20% from the industrial production of Romania.

From an administrative point of view, the city is divided into six districts and it is surrounded by a rural adjacent area called Ilfov Agricultural District. The main industrial areas are at the city margins, while in the centre there are residential areas.

The capital of Romania faces problems that sometimes distinguish it from its statute of European Capital, and one of the most serious issues is the pollution.

Bucharest occupies the *leading place* in the most recent *countdown of the most polluted cities in the European Union*. The main *pollution source* of the Capital is the *road traffic*, responsible for about 70% of the air pollution. The *electrothermal plants*, the *industry*, the *construction sites* and some *heating household equipments* occupy the next four places in the countdown. The *maximum level* of contaminant and dust

pollution *is frequently exceeded* and there are cases when the measured levels impose immediate measures, exceeding the *alert limit* represented by the double of the maximum admitted level.

Solutions:

- Supplementary taxes for vehicles that release a great amount of toxic gas;
- Permanent service of the existing parks;
- Creating new green spaces around the block of flats;
- Obligatory installation of filters at the electrical plants furnaces in order to reduce the quantity of contaminants released in the atmosphere;
- Educating the population by means of ecological campaigns;
- Involving students and undergraduates in the service of parks: planting trees and cleaning the waste in the park;
- Development of public transportation in order to reduce the number of vehicles used in the city;
- Extending the areas where vehicles access is forbidden.

### **Petroșani**

Petroșani is the main municipality in Valea Jiului, at 350 km from the capital and at 91 km from Deva municipality. Here it is the Headquarters of the National Hard Coal Company, which operates mining exploitations.

It is the most important centre of mining exploitation and the activities performed at the level of Petroșani municipality negatively affect the soil, water and air, creating disorder in the normal life circle of flora and fauna and represents a serious danger for the population health. Some of the main pollution sources are the following:

- Land deformation due to underground exploitations;
- Emissions of gas and ash;
- Scenery degradation;
- Wastes (industrial, toxic, dangerous, household);
- Polluting the atmosphere due to the release through furnace of gas and solid products of the units that produce thermal agent, of the thermal plants that operate within mining units and of other enterprises, of the fires in dumps, of vehicle transportation etc. that also negatively affect the soil;
- Gas products released in the atmosphere, released in contact with water and cause acid rains;
- Used waters and residual waters chemically polluted and released in the underground;
- Residual waters (that contain bacteria, viruses, oils and fats) released into nature from hospitals and services or gas stations;
- The air is polluted by thermal plants, vehicle transportation, blower stations from mining units, technological processes (dyeing, casthouses, soldering etc.);
- Discoloration of foliage and partial or total loss of leaves which will favor the aggression of biotic pests;
- Flora and fauna are more and more affected by pollution.

In order to avoid a part of the negative effects caused by the Industry in the area, the following objectives are proposed:

- Introducing non-polluting technologies in the industrial processes;
- Reducing the quantity of used waters released in rivers and introducing the process of water recycling;

- Recovering useful materials from used waters, thus ensuring a real source of raw materials;
- Improving the clearing efficiency by perfecting technologies, equipments and their exploitation;
- Creating a household waste collecting service;
- Reducing the number of vehicles by introducing a better organized public transportation;
- Setting up of green spaces on bigger areas.

### **Roşia Montană**

Roşia Montană is the oldest mining locality in Romania, being established for more than 1870 years. Presently, Roşia Montană is threatened by destruction by the project proposal of the company Roşia Montană Gold Corporation.

This project will have the following negative effects:

- Moving of approximately 2.000 people, respectively of 800 households (740 individual houses and 138 apartments), of 8 churches, of 9 cemeteries, schools etc.;
- Destroying important historical vestiges, centennial churches;
- Approximately 3.000 hectares are condemned to desertification or transformation into ponds by using toxic load;
- Destroying the scenery by open mining exploitation;
- Big used quantities of cyanide necessary for gold exploitation will always threaten the area;
- Significantly affects all environmental factors (water, air, soil) and all life forms will be directly affected on an area of at least 1600 hectares and indirectly, on a hard to estimate area;
- This exploitation will in short time finish the natural resources;
- Compromises the sustainable development of the area and a series of economic activities at regional level (for example, exploitation of the natural potential by tourism, agrotourism) for a long period.

In order to save Roşia Montană there are many projects unfolded and many people are involved in saving this area. Roşia Montană is the proof of the ancient mining technology, because leads in the hard and volcanic rock were attacked and they were extracted by digging galleries. From this point of view, Roşia Montană is unique in the world and we have all arguments to propose it in the UNESCO patrimony, which would lead to its salvation.

Moreover, there are mining sites registered in the UNESCO list that are representative (most of them) either for the Modern Age, either for the Middle Ages. In Roşia Montană one could see the proof of the mining history that began 2000 years ago, from the Roman Age until the contemporaneous period, and the Carnic massif is a representative of the whole European mining history. In one massif one could see all the mining techniques used since the Roman period until the 20<sup>th</sup> century – which is absolutely unique in the world.

Roşia Montană project was very controversial and continues to be as long as the civil society and environmental organizations in Romania and foreign countries will support the fighting against the aforementioned project (which could represent a total environmental disaster).

### **Conclusions**

Even in 2011, despite modern science and techniques, we can notice that humankind cannot control nature and there are still limits that cannot be crossed.

Thus, one of the best solutions is to live in harmony with the nature and respect and preserve Romanian traditions. Adjusting traditional elements within every ecosystem will ensure an ecological



lifestyle and a sustainable development and the non-regenerative resources may be used by future generations as we enjoy them now due to our ancestors who lived a simple life and respected nature.

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