The Management of Environmental Resources and its Regional Implications

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Abstract: The management of environmental resources at regional level is closely related to social, economic and community's activities. Community's activities should be led taking into account the environmental sustainability. Preserving and improving environment's quality is one of the main national objectives in nowadays Romania. Under these circumstances the main purpose of our research is to highlight the major aspects of this debate. Therefore, the study of social and economic activities impact on the environment is a major issue that modern society has to face today. As a consequence there is necessary a well balanced management for the environment resources in accordance with certain rules and terms, not only at local level, but also at regional and national level.

Keywords: regional development; environmental sustainability; environment's quality

JEL Classification: F64; O1; Q01

Introduction

Nowadays, the environment's deterioration is a major issue and its effects could be seen at local, regional and global level.

The economic growth in excess in one hand, and on the other side the underdeveloped regions bring new issues to debate in the third millenium. As a consequence, the management of the environment's resources, in accordance with the legal framework is a main priority and it requires the development of sustainable management plans, focused on three areas: economic, social and ecological. For each of these three domains it is necessary to establish some well defined objectives that include the sustainable ecological activity.

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The need to study the compendium on the development and conservation of the environment issues caused our orientation towards the start of a series of specific research. According to our analysis, the conclusion that emerges is the need to ensure a multidisciplinary approach to the problems posed by the environment, especially in terms of sustainability both locally and especially at regional level. (Hristache et al., 2010). Only in this way the economic and social objectives, specific to each human communities, must be achieved.

The Regional Development from the Perspective of Environmental Sustainability. Case Study: Romania

The impact study regarding the regional sustainable development of Romania, from the perspective of environmental sustainability, points out some unfavorable aspects.

First, the protection of the environment, in the context of sustainable development includes several landmarks such as: combating pollution phenomena, inherent to some human activities; prevention of possible environmental damage; European standards regarding the environment's protection should be adapted, assimilated and applied. There also should be included: international projects for Danube and Black See membership countries; biodiversity and wetlands' protection; projects regarding activities of monitoring water quality and forests, global ecological phenomenon effects; solving acute ecological issues, such as: reduction and recovery of waste, green agriculture, promoting green technologies, sustainable transformation of human settlements (The National Plan for Development 2007-2013).

In consequence, the activation of environmental sustainability principle in Romania's area, in our opinion, requires for a connection between this principle and the social and economic objectives at national, regional and local level. We highlight and take into account the communication component – moreover, we consider that this principle must be developed according to the communication component built both at institutional regional level, and at community level. (Fig.1).

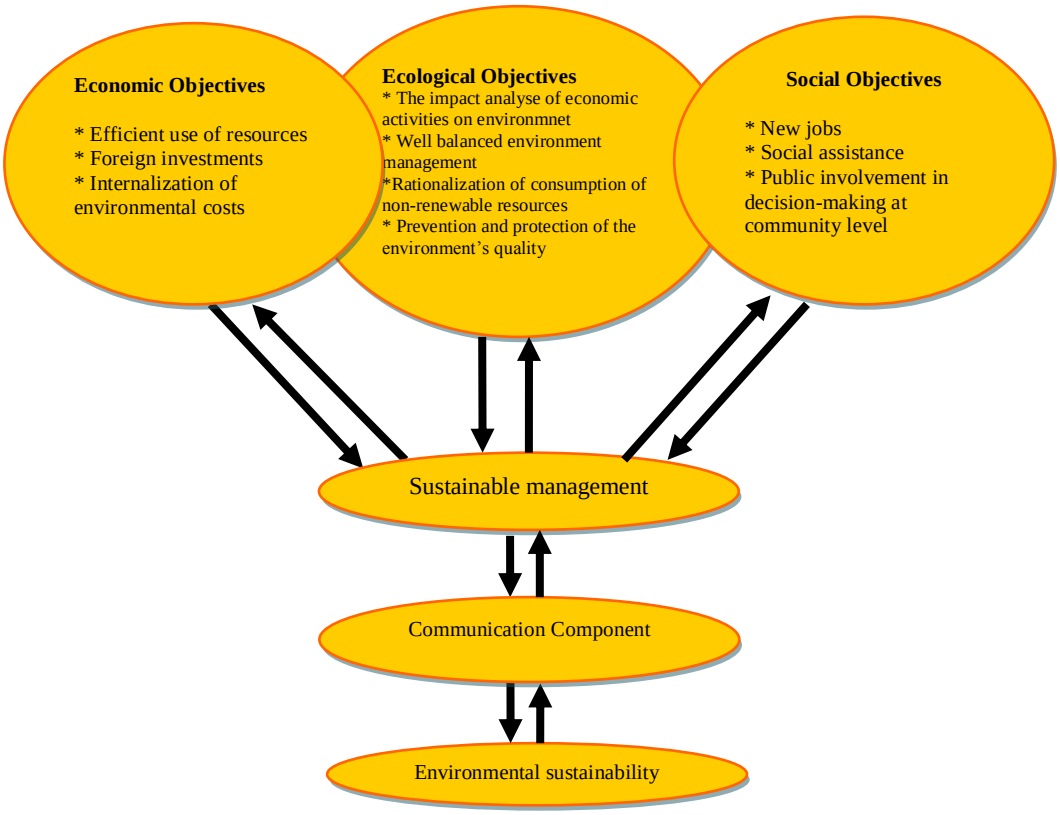

Figure 1. Environmental sustainability and its image

The major side of communicational component at Romanian regional and local area is considered to be more important, as it generates the necessary feed-back for the activation of sustainable management, under the circumstances of Romanian policies of environment, policies that have as main objectives: ensuring a clean environment for the health of the inhabitants of the country, stopping the vicious circle of poverty and environmental damage, ensuring innovative regenerative growth for the benefit of present and future generations and the harmonization of specific environmental legislation with that of the European Union, with an large emphasis on the bilateral relationship between *environmental protection and sustainable development*. (The National Plan for Development 2007-2013).

In Romania, one of the unfavorable aspects is given by the difference between European and Romania standard environmental indicators, but this aspect could be removed by more foreign investments in Romania. One of the most important positive aspect of foreign investments in Romania leads to the ecological rebuilding, which is so much necessary in our country.

In the bilateral relationship between economic and environmental activity, *industry* has the leading role. Industry is the main branch of the Romanian economy, but in the same time is also the major activity which generates pollution.

In 1991, industry was 43.3% from GDP, in 1992 it was 44.7% from GDP and in 1994 it represented 32.3% from GDP (Negrei, 2004). In the 2010 there is mentioned an industrial increase in GDP represented by an increase from 23% in 2008 to 26.4% in 2010 (Dachin, 2012).

But this branch causes also negative effects on all categories of environmental factors: air pollution, soil pollution, forest damage, waste management. There are lots of causes for these situations: old technologies or less productive raw material; high energy consumption; from technological processes result large quantities of waste; air pollution is not controlled and monitored; huge quantities of fugitive emissions; lack of an environmental management system; low productivity; too much employees; lack of agreement with the third parts for maintenance services (Register of environmental pollutants in activities covered by the IPPC Directive, 2003).

Air pollution has by far the most negative effects, as air is perhaps the most important environmental factor. Air is essential for life; airless human body can survive not more than a few minutes, while without water human body can live few days and without food even few weeks. The amount of air that the human body needs for a period of 24 hours is equivalent to 12 to 14 m^3, while the need for water is 2-3 liters and only one kilo for foods (Fauci & colab., 2003).

Even since1992 there were alarm signals regarding the air pollution. So, the ending conclusions of the United Nations Conference for Environment and Development from 1992 that was held in Rio de Janeiro, underlined the fact that the air pollution is the most critical problem which affects the future of human being, as each ecosystem is closely bound to the earth atmosphere composition. In accordance with the World Health Organization, by their action air pollution could be classified such as: irritant pollutants, fibrosis pollutants, allergy pollutants, asphyxiating pollutants, toxic pollutants and carcinogenic pollutants. For these categories there are national emission edges, which regulate the maximum of the allowed amount.

In Romania, the quality standards for surrounding were first established in 1973, revised in 1987 and today there is in use Law no.104/15.06.2011 concerning ambient air quality published by The Official Monitor of Romania, Part I, no. 452, 28 June 2011. The purpose of the law is to protect human health and the environment as a whole. Also, the Ministry of Environment and Forests delivers the necessary information and details regarding the maximum limit of air pollution, daily and for a short period of time.

However the air quality in many areas do not fit with the established limits, and the consequences could be seen in the surroundings of human settlements, poor state of green lands, illness linked to pollution and high rate of mortality. In Romania we can talk about air pollution especially on regional and local area, with industrial platforms situated in the neighborhood of big towns. Pollutant emission of specific economic activities alters the environment and the air quality, giving rise to chain effects: greenhouse effect, acid rain, deterioration of soil, flora and fauna, and at the same time people are exposed to serious dangerous illness, which sometime could be irreversible.

Pollution degree of the atmosphere and air quality in Romania varies in accordance with the level of economic growth of the urban area. Database from 1991 shows that 9% from the settlements in Romania were negative influenced by a low quality of air; all these human settlements belong to well developed industrial areas. There could be mentioned: for non-ferrous metallurgy settlements such as Copşa Mică, Baia Mare and Zlatna with more than 50% lead emissions; for steel industry settlements such as Hunedoara, Galaţi, Reşiţa and Călăraşi with more than 50% emissions of dust suspensions, sediments and carbon dioxide; chemical and petrochemical industry with pollution in human settlements such as Făgăraş, Borzeşti, Săvineşti and Oneşti with sulfur dioxide, hydrochloric acid and nitric monoxide; electric power industry: electric power plants that run on fuel, coal, oil and natural gas in industrial settlements such as Rovinari, Turceni, Valea Jiului and Bucharest with high quantities of carbon dioxide, sulfur dioxide, carbon monoxide, soot, oxides of nitrogen and particulate sediments.

Studies made in these areas by series of Health research Institutes highlight serious negative effects of pollution over population's health of those who are living in these areas. For example, in Copşa Mică the exposure to extremely high lead emission had a great impact over inhabitants health and in special on children: more than 40% of pupils had disorders of lung functions (much lower than normal), more than 50% of pupils were under weight and height and in general there can be noted an increasing rate of respiratory diseases in the whole population living in these areas. In Zlatna, on 40% of examined children there were significant nervous shortcomings. Also in areas such as Năvodari and Râmnicu Vâlcea there should be underlined an increase of respiratory diseases and an increasing rate of mortality caused by these diseases.

The main polluting substances, depending on the frequency of exceeding the maximum concentration allowed level for the *period 1990 - 1994* were: dust suspension – up to 100% , lead – up to 100%, ammonia - up to 100%, sulfur acid – up to 58%, sulfur dioxide – up to 47%. These effects were corroborated by other phenomena: the area of agricultural land affected by various factors of pollution amounted to 6.3% of the country's agricultural area and forest area affected by pollution caused by drying was 7.3% of the total forests, in the year 1992. As a

result of these imbalances produced by economic and social activity in Romania we could mention the extinction of 8 species of wild animals and 17 species of wild flora (Negrei, 2004).

Thus, we can observe that air pollution may act directly on the population, causing some health problems, but may also have indirect effects on the population, through the influence of other environmental factors, with subsequent effects on communities.

For the *period 1994 - 2004* the balance of collected data generates the following statistic table. For ammonia, in three most polluted cities in the country - Râureni, Săvineşti and Târgu Mureş – there has been a sharp reduction in frequency of exceedance (Săvineşti, from 11% in 1996 to 0% in 2003 and Râureni from 9% in 1996 to 1.76% in 2003). In three of the most polluted cities in the country, Arad, Baia Mare Copsa Mica for particulate matter, there was a decrease in the frequency of overflow - Baia Mare, from 28.6% in 1997 to 0% in 2003 - but there was a significant increase from 1997 to 2003 in Arad. (National Plan for Development 2007-2013). It is noted that nationally, particulate matter and sediment are the main pollutants.

In the year *2010*, at national level the limit of air pollution emission, which regulate the allowed amount of air pollution had the following values (Fig.2.)

SulfureDioxide (thousand tones/year)	***NitrogenOxides (thousand tones/year)***	***Ammonia (thousand tones/year)***	***VolatileOrganicCompounds (thousand tones/year)***
918	437	210	523

Figure 2 The national air pollution emission limits for 2010

Source: Database from Ministry of Environment and Forests on-line: http://mmediu.ro/legislatie/controlul_poluarii.htm

The level of air pollution of these particles is still at an increased level and in many monitored regions the accepted level exceeds the maximum permissible concentrations (figures are given during 24 hours and during an year). The figures underline the fact that we need to focus on regional development and on the implementation of the environmental sustainability.

Unlike the above areas, for Bucharest, the data collected by the National Environmental Protection Agency recorded positive values. Thereby in March the general air quality index that includes in its composition sulfur dioxide (SO2), nitrogen dioxide (NO2), ozone (O3), carbon monoxide (CO) was at a very good level. (National Environmental Protection Agency)

Nowadays, in Romania there are 142 continuous monitoring stations for air quality, equipped with automatic measurement of key atmospheric pollutants. Monitored pollutants, measurement methods, accepted limits of emissions, alert and information thresholds and criteria for location of monitoring points are agreed in accordance with the national framework for Atmosphere Protection and comply with the requirements of European regulations. (National Environmental Protection Agency)

Thus, air pollution represents the presence in the atmosphere of foreign elements of the natural composition of the air, which by their nature, by the concentration and the time they are acting on the body can be harmful, causing health problems in people exposed. Sources of air pollution can be divided into two groups: natural and artificial sources.

Natural sources include soil erosion process (resulting particles entrained by air currents in the atmosphere), plants and animals (pollution pollen, hair, feathers), volcanic eruptions (throw particles, gas and smoke into the atmosphere - persistence long), cosmic dust and more.

Artificial sources are resulting from socio-economic activity and represent a true source of air pollution. In this category are included also various industrial processes: non-ferrous metal industry, chemical industry, steel industry, building materials, etc.

In accordance with the previous underlined database concerning the harmful action of atmospheric pollutants on human health, it is necessary to develop measures to prevent and control air pollution which should include two categories of rules regarding pollution prevention: health measures and socio-economic restructuring measures, in conjunction with the environmental quality.

The medical measures are measures that consist in establishing maximum permissible limits or concentrations of air pollutants (maximum concentration which is not injurious to the body). Thes barriers are established in relation with each pollutant indicator and should be controlled by the authorities which are charged with the pollution prevention of the environment.

The socio-economic restructuring measures, in conjunction with the environmental quality, should be applied by specialists with the purpose to precisely achieve maximum admissible concentrations without exceeding them. We set out in this category: developing industrial buildings outside the human settlements, on industrial platforms; establish on the calculation base of certain distances required between industrial enterprises and houses depending on pollution; using less polluting fuels or their treatment to remove impurities; ensuring a more complete combustion to decrease pollution's level; installing industrial equipment with containment or to neutralize pollutants; regulating combustion to vans by reducing exhaust pollutants; restructuring through qualitative changes; removing technology

with high obsolescence and physical, both in relation to the possibilities of exploitation of resources and compared to the volume of pollutant emissions, etc.

As regarding the expenses related to environmental activities, from data provided by the National Institute of Statistics, expenditures for environmental protection at the national level showed an upward trend, but the investment percentage in environment in GDP is still very low compared with that of countries of European Union.

Conclusions

Lately we are witnessing an increasingly promoting process of the environmental concept, more intensive, regarded as a component of the development of human society. This approach is a fact universally understood and accepted.

The idea of community development and economic development without resource depletion by moving beyond the limit of affordability and regeneration of ecosystems has led to the concept of sustainable development or sustainable management (Bran, 2002). In conclusion, we can state that in order to properly perform an analysis of the relationship between the socio-economic structures and ecological balance there should be considered at least three criteria: resource consumption, which is reflected in pressure on the fund and natural capital stocks; the volume of pollutant emission, which is reflected in air quality; business efficiency, which is reflected in the financing capacity of environmental costs. (Negrei, 2004)

It is therefore essential the need for coordination of the efforts not only regionally but also internationally, in order to find a legislative framework and develop an action plan for environmental protection, on standards imposed by activating the principle of ecological sustainability. Engaging the civil society in this way is a step worthy of being highlighted, but only with the condition that the relationship between the state and civil society will be held by active communicational platform where the citizen is regarded as an active and strict partner towards the issues of community he is part of.

References

Bran, Florina (2002). *Ecologie generală şi protecţia mediului/ General Ecology and Environmental Protection*. Bucharest: ASE.

Bran, Florina; Ioan, Ildiko; Marin, Dinu & Mockesch, Carmen (1999). *Mic lexicon de protecţia mediului/ Small lexicon of environmental Protection*. Bucharest: Economică.

Brown, Lester; Flavian, Christopher & French, Hilary (2000). *Probleme globale ale omenirii. Starea lumii 2000/ Global problems of mankind. State of the world 2000*. Bucharest: Tehnică.

Cămăşoiu, Camelia (1994). *Economia şi sfidarea naturii, Alternativa dezvoltării durabile în România/ Economy and defying nature, the alternative of sustainable development in Romania*. Bucharest: Economică.

Dachin, Anca (2012). Industria – sursă vulnerabilă de relansare economică în România/Industry - vulnerable source of economic recovery in Romania. *Economie teoretică şi aplicată/ Theoretical and Applied Economics*, Vol. XIX (2012), No. 1(566).

Fauci, A. S.; Braunwald, E.; Isselbacher, K. J.; Wilson, J. D.; Martin J. B.; Kasper, D. L.; Hauser, S.L. & Longo, D. L. (2003). *Tratatul de Medicină Internă al lui Harrison/ Treaty of Harrison's Internal Medicine*, 14th Edition. Bucharest: Teora.

Hristache, Diana Andreia; Iacob, Silvia Elena; Paicu, Claudia Elena & Popescu, Constatin (2010). An approach of sustainable development from the perspective of the communicational paradigm. *Metalurgia International/International Metallurgy*, Vol. XV, Special Issue no. 1.

Negrei, Costel (2004). *Economia şi Politica mediului/ Economy and environment policy*. Bucharest: ASE.

Vişan, Sanda; Angelescu, Anca & Alpopi, Cristina (2000). *Mediul înconjurător. Poluare şi protecţie/ Environment. Pollution and protection*. Bucharest: Economică.

***National Agency for Environmental Protection http://www.calitateaer.ro/indici.php.

***Bulletin to inform the public about the air quality in Bucharest on 28.03.2011, National Agency for Environmental Protection, available on-line at http://arpmbuc.anpm.ro/articole/arhiva_buletine_calitate_aer-165.

***National Development Plan 2007-2013, available online at http://www.oirposdru-vest.ro/Documente%20utile/pnd_ro.pdf.

***Register of environmental pollutants in activities covered by the IPPC Directive, 2003, available online at http://mmediu.ro/legislatie/controlul_poluarii.htm.

*** Rio Declaration on Environment and Development, 1992, available on-line at http://www.un.org/geninfo/bp/enviro.html.