

Development of Sustainable Agriculture - a Key Element for Romania's Progress

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Abstract

Sustainable economic development is characterized by achievement of economic growth and maintaining a favorable environment which does not reduce the potential of future generations to meet their necessities. Sustainable development favors the development of economic-social progress over a long period of time. The attribute of sustainable in economic development means maintaining capacity of natural systems to provide energy and raw materials and to absorb the waste produced in the process of economic goods manufacturing.

Sustainable agriculture should lead to farmers' increased income, which can improve rural living standards and expand employment in rural areas.

Increasing agricultural and non-agricultural employment, in rural environment requires larger investment volumes, a process stimulated by the development of sustainable agriculture.

Key words: *sustainable development, sustainable agriculture, environmental protection, natural capital*

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Introduction – Importance of Sustainable Agriculture

Sustainable economic development is characterized by maintaining a favorable environment and achieving economic growth which does not reduce the potential of future generations to satisfy their needs at least at least of the level of the current ones¹. It allows the manifestation of economic progress and social benefits for a long period of time. The attribute 'sustainable', in development, means maintaining the capacity of natural systems to provide energy and raw materials and absorb waste resulted in the process of economic goods' production.

Defining Sustainable Agricultural Development

Sustainable agricultural development means the production of agricultural goods, necessary to satisfy the needs of present and future generations, in terms of protecting components of natural factors, like water, air and soil.

¹ Preda, D., *Employment and Sustainable Development*, Economic Publishing House, Bucharest, 2002, p.93;

Sustainable agriculture uses technologies and production methods that meet ecological environmental development requirements.

Sustainable agricultural development requires the prevention of ecological crises, like major accidents, with strong negative impact on the environment. The concept of ecological crisis emerged in the 70s, in the last century, when it was considered that environmental issues were negative collateral consequences of socio-economic progress. For solving negative problems, there were supported technological adjustments and restrictive regulations to reduce and prevent environmental pollution.

Environmental problems occur on large geographic areas, starting with the local level, continuing with the regional or continental one, and ending on a global level. The global level prevents environmental problems from getting solved and requires other global approaches.

Globalization is an objective developing process of contemporary world that has a high potential for making the world better. The main causes of globalization are represented by two processes, one technological and another political. The technological process consists in a strong and rapid development of communications and transport. The means of communication allow people to connect and interact on large geographical areas. The vehicles allow people to move and interact in a short time over long distances.

Political processes have made national borders easier to pass or disappear by creating international organizations.

Environmental issues are related to contemporary social economic development. The main socio-economic issues to be addressed are: combating poverty, changing consumption and production structures, demographic dynamics, environmental and human health protection.

The survival of the society as a whole is influenced by individual behavior and the behavior of various communities.

Maintaining Favorable Environment - Prerequisite for Individual Harmonious Development

Fulfilling life requires the individual to have at least a satisfactory economic situation and take advantage of freedom, social order and ecological security. It requires the individual to integrate harmoniously into the community where he lives and works². Fulfilling life requires man to enjoy simple pleasures.

One must participate in actions which produce pleasant emotions, which generate positive changes, in the human body, in the heart rate and brain waves. Such actions may mean spending long periods in clean natural environment, enjoying natural sights, which engenders pleasant emotions, clears the state of unrest, relaxes, and encourages the individual and increases his creativity³. One must look and explore the universe and enjoy the richness of diversity.

Participation in such pleasant moments enhances the joy of life and makes the individual play and perform certain activities only because they are funny and produce pleasure. Play stimulates the spiritual life and social behavior. It stimulates individual development when the man is not subjected to the aggressive desire of winning.

A clean natural environment provides the possibility to satisfy the need of recreation, to restore the individual potential for work. People's major shortages are not necessarily economic, but existential, related to their need for recreation, peace of mind, self-fulfilment and contemplation.

² Popescu, C., Taşnadi, A., *Re-spiritualization. Learn to be human*, ASE Publishing House, Bucharest, 2009, p.379

³ idem, p.381

Elimination of existential deprivation requires the creation and adherence to a value system that includes protecting the natural environment and preserving its quality.

People need to live life with the utmost pleasure, in a pure natural environment, which favors the extension of life expectancy. They must preserve the quality of the basic components of the natural environment, water, air, earth.

Today, in our country, people face serious environmental problems due to their peers' detrimental activities, such as cutting large areas of forest, landslides, extensive destruction of flora and fauna.

To reduce and eliminate negative human actions on natural environment, the behavior must be improved through education and by establishing appropriate legislative and economic measures⁴.

Sustainable agriculture has following objectives:

- satisfying human needs of food and agricultural material resources;
- conservation of environment and natural resources;
- increase efficiency in using of renewable and non-renewable natural resources;
- economic efficiency of agricultural activities, of the living standards of farmers and members of society.

Protecting the Natural Environment – Condition of Sustainable Development

Natural balance has been severely damaged by human action. Such interventions are:

- attracting increased amounts of natural resources in economic activity;
- extension of cultivated areas;
- massive deforestation for wood and new land for agriculture;
- intensifying use of pastures;
- extending the underground exploitation⁵.

Deterioration of natural balances by human intervention increased in the second half of the twentieth century. Profound and accelerated environmental changes lead to increased natural phenomena such as floods, typhoons, volcanic eruptions and other⁶.

Prolonged pollution of the natural environment has damaged human living conditions. Deterioration of natural environment by man means destroying the ecological balance and the emergence of less favorable environmental conditions to life and socio-economic activities.

Pollution is a universal liability phenomenon which is amplified along with the expansion of technical progress.

An aggressive form of pollution which destroys the natural environment and life is radioactive pollution which determines concomitant contamination of air, water, soil and subsoil. This type of pollution has long-term impact on all life - plants and animals.

Restoring the natural balance calls for most industrial, agricultural and transport to take place in accordance with the ecological requirements and not for profit generated even at the risk of environmental pollution.

In relation to the nature, man must have a responsible attitude, as growth and quality of life are conditioned by maintaining and improving the quality of the natural environment. Any violation

⁴ Popescu, C., *Rationality and hope. The whole alive paradigm*, Renaissance Publishing House, Bucharest, 2006, pp.142-149;

⁵ Marinescu, D., *Environmental Law*, Chance Publishing House, Bucharest, 1993, pp.3-18

⁶ Mihut, I., *Self-Managing and Creativity*, Cluj-Napoca, Dacia Publishing House, 1980, p 259

of the relationship between economy and ecology sooner or later engenders social and economic disruption, with negative consequences for society. Protecting natural environment requires the prevention of ecological imbalances, which is less expensive than their remedy. Furthermore, there is a level of environmental degradation that is impossible to restore to the natural environment.

Protecting natural environment determines life on earth in its various forms and economic and social progress.

The natural environment is a component of the living, the other component being man-made environment⁷.

In order to fulfil and live life in a healthy environment and to continue to benefit from natural resources, one must protect the natural environment. In this respect, the academician N.N. Constantinescu said that in addition to the analysis of adequate economic and social indicators, the improvement of life quality involves developing a coherent set of environmental indicators which should highlight⁸:

- a) the extent of exploitation of nature by various activities;
- b) the degree of normality of ecological renewal cycle of renewable resources;
- c) the evolution of environmental quality.

Aspects of Sustainable Agricultural Development

Sustainable agricultural development requires ensuring a balance between economic growth and environmental protection in order to meet the current and future needs of the economic and social life.

Scientific Substantiation of Sustainable Agriculture

Scientific substantiation of sustainable agriculture is based on a bio-economic concept, developed by N. Georgescu Roegen, which summarizes the relationship between human and natural environment.

The Romanian economist developed the concept of entropy which addresses economic growth closely related to resource evolution and environmental problems. The concept of entropy reflects the degradation of natural resources and energy that takes place in economic life and beyond⁹.

The production of economic goods implies consumption of low entropy and growth of high energy of the whole system. All human actions continually generate, in an economic environment, an increase in entropy by extraction and consumption of low energy from the environment¹⁰. The unit cost of economic goods should take into account the low energy degradation and transformation of it into high-energy, implicitly related to the cost of resource depletion¹¹.

⁷ Popescu, C., *Rationality and hope. The whole alive paradigm*, Renaissance Publishing House, Bucharest, 2006, pp. 34-40

⁸ Constantinescu, N.N., *Economics of Natural Environment Protection*, Bucharest, 2000, p. 92

⁹ Georgescu-Roegen, N., *Man and his work*, Expert Publishing House, 1996, pp. 187-188

¹⁰ Drăgan, J.C., Demetrescu, M.C., *Millennium III economist Nicolae Georgescu-Roegen Prophet architect of the new thinking*, Nova Europe Publishing House, Bucharest, 1994, pp.152-154

¹¹ Răgălie, S., "The Romanian energy market opening and the new values of the binomial, the price of energy-consumption of resources for industrial consumers", in *Monetary and financial processes of transition: issues and dilemmas*, Alpha Publishing House, Buzău, 1998, pp. 487 - 490

According to N.G. Roegen, the average price of each type of energy resource must take into account the degradation in waste of low energy and the real cost of restoring degraded environment.

In sustainable agriculture there must be farms that should:

- o use of management techniques that maintain environmental integrity;
- o preserve the landscape beauty and biodiversity;
- o be effective on the long-term from economic and social perspective;
- o increase the contribution of biological factors (using bioenergy and biotechnologies) to increase plant and animal production.

Development of Sustainable Agriculture in Romania

Building a sustainable agriculture takes very long and requires overcoming barriers such as:

- o reducing pollution and maintaining various types of environmental quality. An important issue is groundwater pollution and its solution is complicated by the fact that the pesticide labelling regulations do not always require manufacturing companies to inform farmers about pesticide use and dosage, and the level of pest damage. And also in the case of informing farmers there is no control system for application of pesticides and chemical fertilizers in normal doses;
- o use of natural resources that are state subsidized and offered at low cost (water for irrigation, for example), which leads farmers to use more than optimal;
- o lack of flexibility of farmers in their response to market signals.

In Romanian agriculture have emerged and worsened problems such as:

- o Pollution of surface and groundwater, especially by increasing amounts of nitrates and phosphates;
- o Increasing the incidence of damage to human health caused by the presence of residues, pesticides, chemical fertilizers, additives, heavy metals in food, water, soil;
- o Agricultural pollution caused by intensive livestock;
- o Air pollution caused by crop spraying and spreading on the fields of liquid manure;
- o Erosion and soil pollution.

In Romania, the Land Law implementation caused excessive division of agricultural lands, which involves the application of efficient technologies¹². Increasing the farm size to the optimum level can be done in the following ways: purchase of land, small farmers association in condition of maintaining ownership of land and means of production, land rent by owners who cannot work.

Other measures that contribute to sustainable agriculture are:

- o the use of chemical fertilizers in rational quantities;
- o providing financial incentives to farmers to purchase agricultural machinery, seeds etc.;
- o financial support for farmers to raise their quality of work and income.

By creating and developing sustainable farms are obtained the following effects:

- o food security for the population;
- o improving human health by providing agricultural products which do not harm human metabolism;

¹² *** *Romania in the European Union. Convergence potential*, Supplement of the journal Theoretical and Applied Economics, June 2006, pp. 323-324

- o raising the quality of life in rural areas;
- o increase the quality of agricultural products;
- o increasing the number of jobs in rural areas;
- o extending the use of advanced technologies, resulting in lower production costs;
- o increase value added in agricultural activities by improving product processing;
- o development of professional skills and knowledge of farmers;
- o improving rural infrastructure etc.

The organization of farms is based on principles such as: economic, ecological, social and ethical.

Economic principle means getting bigger profits from economic activities. Ecological principle means protecting soil, water and air of actions of long term negative factors. Social principle means making jobs in rural areas by developing a multifunctional agriculture.

In the Romanian rural area, most jobs are agricultural and ensure low income which only allows subsistence of workers. Ethical principle is to provide quality conditions for livestock.

Soil - The Primary Resource of Sustainable Agriculture

Natural capital represents the components of the environment. It can be modified, but can not be replaced. Existence and human progress, farming and animal husbandry have underlying soil, with water resources and biodiversity. Soil is a natural system composed of substances in continuous transformation, which is a filter for environmental health. He has the ability to reflect, influences of flora, climate, fauna, economic and social activity, to the material that it formed, in a long period of time.

Soil is the cornerstone of agriculture with physicochemical properties and fertility needed to give plants the nutrients necessary for their development. He provides food for livestock and space for their shelters.

The soil provides conditions for maintaining genetic biodiversity, for development and reproduction of many and diverse living beings.

The main economic function of the soil is food security, being the only source of nutrients for growing plants and livestock, giving, however, vegetal material to obtain biodiesel, an unconventional energy, clean for environment. Human need of food production should be achieved by using raw materials and energy provided by the earth. The soil has an ecological function as it preserve water resources and maintains carbon as organic matter.

Protection of freshwater resources, of the earth is urgent since they are in decline, and reduce carbon emissions contribute to reducing the greenhouse effect.

Technical progress has led to increased labor productivity in agriculture. Thus, by promoting highly productive agricultural machinery and irrigation expansion, the agricultural production grew strongly. Sustainable development requires maintaining and enhancing soil fertility, soil health recovery. Excessive use of fertilizers can result in pollution, and scientific research has among its objectives the prevention of soil degradation and preservation.

Soil fertility has different degrees from one area to another in our country and over time tends to decrease. The rational use of fertilizers in amounts and proportions recommended by soil type can maintain soil fertility.

Other measures that contribute to soil conservation are:

- o combination of chemical fertilizers, minerals and organic residues represented by vegetal, urban and industrial waste;

- o stimulating the natural processes involved in plant nutrition, like biological fixation of atmospheric nitrogen.

Soil fertility status in our country is influenced by the actions of factors such as:

- o evidence of excessive droughts over wide areas;
- o the occurrence of periods characterized by excess moisture which generates substantial losses of crops in some areas;
- o soil erosion;
- o chemical pollution caused by industrial activities;
- o pollution by industrial waste;
- o making inadequate agricultural work;
- o diminishing farmland by building roads, residential or industrial buildings.

Conclusion

Sustainable agricultural development has numerous economic, social and environmental effects at micro and macro level, leading to increased performance.

Organization of durable agricultural activity is based on economic, environmental, social and ethical principles.

According to the economic principle, competitive agricultural farming activity must be profitable; income must allow recovery of expenses and obtaining profit. Agricultural income can be obtained on various ways such as:

- o marketing of viable agricultural products;
- o processing of agricultural products and the sale of economic goods supply, demanded by consumers;
- o providing renewable raw materials used for manufacture of various industrial goods;
- o development of agro-tourism etc..

Ecological principle requires protection of natural resources, soil, water, air by action of negative long term factors. Earth is the subject of labor and mean of work in agricultural. It is used in a harmful way, when, by the pollution and erosion is destroyed its quality; this damage is possible in a period of few years of cultivation. To restore the quality land requires a long period of time.

Social principle involves developing a multifunctional agriculture to create more and varied jobs in rural areas. In our country, the majority of jobs in agricultural and rural world are generating income only for ensuring the survival of workers. Non-agricultural jobs have a low share in conjunction with reduced volume of non-agricultural activities.

Ethical principle requires the creation of conditions for shelter and food for animals, in order to protect them, and provide healthy development.

The basic effects of sustainable agriculture are:

- o food security for the population;
- o ensure human health;
- o raising the living standards of rural population, driven mainly by income growth of agricultural workers;
- o improving the quality of vegetal and animal agricultural products;
- o creating new and varied jobs in rural areas;
- o increasing number of young people set in Romanian villages;
- o economic efficiency of agricultural activities;

- o increase added value to the product;
- o development of skills, experience and knowledge to farmers;
- o improvement of agricultural technologies;
- o developing and improving rural infrastructure.

For our country, food security for population requires annual use and cultivation of entire agricultural land. In this way you can get a large surplus of agricultural products that can be exported.

Sustainable agriculture should lead to increased farm income, which can improve rural living standards. Development of quality agricultural products implies the strict control of using fungicides and chemical fertilizers. Increased employment, agricultural and non-agricultural, in rural areas requires increased volume of investment, a process stimulated by the development of sustainable agriculture.

Development of sustainable agriculture is sometimes complicated by the behavior of the human factor, in its various forms.

For example, sustainable agricultural development is negatively influenced by:

- o Farmers, when they excessively use natural wastes to fertilize the land, when they combat pests with pesticides, while banishing weeds with herbicides;
- o Consumers restrict sustainable development when buying products of poor quality, or buy products that travel a long way from the place of manufacture to point of sale. They can support sustainable regional development by buying local quality products.

Efficiency of agricultural activities can be accomplished by:

- o lowering production costs;
- o increasing the processing of agricultural products;
- o increasing product added value by improving product processing;
- o improving marketing practice in agriculture;
- o raising investment for farmers.

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