

## THE TASKS OF SCIENCE FOR SUSTAINABLE DEVELOPMENT

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**Abstract.** *The role of science in guiding society in the process of development becomes fundamental in that science has become the main factor of production, in addition to capital and labor. As the development of humanity has always been conducted, it is obvious that the first science, called to ensure this process, is management science, management. The science that can properly orient the development process towards the sustainable option is ecology - the science of life, the only one able to ensure the maintenance of the global and local ecological equilibrium. The uncoordinated development in the ecological context is doomed to failure. The environment, its quality - must be the ultimate goal of development. That is why we can appreciate that the role of management science and ecological science in the process of sustainable development is fundamental. Romania could, through political will, doubled by scientific guidance, move to sustainable development, but the process is delayed. It is necessary to acquire the new thinking, with more determination and consistency. Our children deserve to live in a cleaner and more beautiful world.*

**Keywords:** sustainable development, science, *the role of management science*

### 1. Introduction

Science has a fundamental role in guiding society, in its development process. It provides the necessary expertise to policy makers. And they should take this expertise into account, so that the path and direction of development has a purpose and a meaning. In addition to capital and labor, science has become the main factor in the production of society (Peter Drucker).

The true purpose of the nations of the world is and will remain development, said Boutros Boutros Ghally, former Secretary General of the United States.

However, being sustainable, sustainable, self-reproducible development, another newer science joins the management in guiding the development process, which cannot be left to chance, but especially, can no longer target only the quantitative economic side, profit, neglecting negative externalities for the environment, generated by polluting linear technologies.

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## **2. The tasks of science for sustainable development**

The science that can correctly orient the development process towards the sustainable variant is ecology, the science of life, the only one able to ensure the maintenance of the global and local ecological balance.

Applied ecology, with its various chapters, can ensure the orientation of the human approach to development, so that development ensures the protection, conservation and improvement of the living environment, otherwise it does not make sense. Development not anchored in an ecological context is doomed to failure. In the coming decades, ecological change will become the driving force behind development, wrote John Mc. Phee in *Nature Control*, back in 1990.

The environment, its quality - must be the ultimate goal of development. Therefore, we can appreciate that the role of management science and ecological science in the process of sustainable development is fundamental. This role can be materialized by predetermining the paths to follow for society and for the economy.

In Romania, the current transition was sector-oriented, only economically and not in a global vision, towards a fully sustainable society. Human communities do not act in the long run, but from today to tomorrow. The current economic subsystem is not compatible with Romania's own natural capital, still rich, but insufficiently capitalized and regenerated, instead degraded, polluted and diminished. These technologies have a tendency to become autonomous, always forgetting that technology must serve man and not determine and condition man. Polluting technologies remain in a reprehensible inertia, despite scientific discoveries that bring revolutionary solutions.

Specialists in ecology and environmental protection are not attracted in the development of development strategy and policies, although Romania has participated in the adoption of Agenda XXI, sustainable development, conducted since 1992, in Rio de Janeiro Brazil, as well as other summits, such as the one in Johannesburg (Rio +10), in 2002. Although in 2002, Bucharest hosted the European Summit on Environment and Sustainable Development in the Carpatho-Danubian-Pontic area, after its conclusion, no concrete measures The scope was not taken by Romania to change the current course of development. This means nothing more than that the concept of sustainable development was not understood, that it was not assumed by decision makers, and scientists do not receive the social order to substantiate, with their creative contribution, the new wave. We could also discuss what is the point of these meetings at the top, if then no action is taken!

With the exception of some regulations, not yet applied, there is no more determined state policy in the field of waste management. Although a strategy and

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legislation have been adopted, many useful substances are permanently lost due to their non-recycling, and the mountains of garbage grow, becoming foci of infection, being removed only through campaign actions.

At the time, the world scientific community appreciated that the 1990s were crucial in stopping the dangerous course of development. We have been in the 21st century for almost two decades, but few things have happened. Cities have not developed their local Agenda XXI to have at least a long-term development plan.

The P.N.U.D. development of sustainable development agendas of Romanian cities stopped at the six plus three funded cities. It was not followed, as was normal, by a national emulation, by the institutionalization of the elaboration of local XXI agendas, for human settlements.

Romania could, through political will, doubled by scientific orientation, move towards a sustainable development, but the process is delayed. The recent creation of collectives and debate committees for a national sustainable development strategy is a positive signal, but the issue must not remain at this stage. It is up to the political factor to decide, and science to offer him the way to action. It is also the message of this presentation.

Pilot projects are needed on a national scale, not just simple public works projects. Why can't we bring our mountains to the situation of an example area, with prosperous households, open to domestic and international tourism, with the enhancement of the natural and man-made heritage?

The hesitations have no explanation. The people of the mountains did not wait and work. Here, at Vatra Dornei, a Mountain Research Institute has recently appeared, made with European funds, through the efforts of a Mountain Man, who is Dr. Radu Rey.... And, the new law of the mountain promulgated in 2018 also provides the organizational framework for a sustainable mountain development, which will maintain the mountain communities in the mountain habitat, while preserving the millennial traditions, crafts and specific art.

The concentration of millions of individuals in huge urban formations proved to be an aberration, said Carlos M. Della Paolera. The architect Le Corbusier stated, since 1963, that: the solution in principle is to seek the balance between man and his natural environment, any escape from this truth being a chimera, which is quickly punished, and the punishment will be received by man himself. Civilizations have risen and fallen, without man fully realizing the full importance of his relationship with nature, which gave birth to him and of which he is a part, Mumford said since 1970. It is time to master the new thinking, to approach the new wave, with more determination and consistency. Of course, our children

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might deserve to live in a cleaner and more beautiful world. It's just another management issue and applied ecology.

The basic document that set out the concrete objectives of sustainable development is Agenda XXI. In the 40 chapters are given solutions in principle on all areas of human activity, which can be the basis for the development of complex development programs. Thus, Chapter 7 of Agenda XXI refers to the sustainable development of human settlements, urban and rural localities, by formulating eight complex programs, which must become for local public administrations - desideratum to ensure the sustainable development of localities:

- Ensuring adequate housing for all, currently about one billion people do not have access to safe and healthy housing;
- Improving the management of human settlements (technicians and administrators), urban areas producing about 60% of the gross national product, but having to develop non-polluting productive capacities;
- Promoting responsible land planning and management, requiring the inventory of land resources and planning for appropriate land uses for all categories of the population, including the low-income, as well as the identification and protection of ecologically fragile areas;
- Ensuring ecological infrastructures (water, sewerage, sanitation, waste management, internet, etc.);
- Development of energy efficient technologies, alternative or recoverable energy resources and sustainable transport, including by expanding public and non-motorized transport;
- Supporting areas threatened by disasters, forecasting and defending against natural disasters, which in 1972-1992 caused three million deaths and 800 million people affected, with total losses of up to \$ 50 billion per year;
- Promoting activities in a sustainable construction industry;
- Development of human resources and capacity building for all the above programs.

As a landscaping expert and urban planner, but also a doctor in Ecology, working for 14 years in the relevant ministry and 20 years in higher education and research, I deciphered the main actions needed to meet the eight goals of sustainable development of human settlements, namely:

1. **Ensuring an adequate housing for everyone** was applied through the National Housing Program, launched by the National Housing Agency (ANL), at

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which I collaborated, at that time, as Director of the Directorate for Habitat (Human Settlements Development) in the relevant ministry. An appropriate and differentiated policy to ensure this first goal is paramount;

**2. Improving the management of human settlements (technicians and administrators)**, is ensured by schooling in specialized vocational schools and in the profile Universities and by periodic retraining through the Regional Centers of the National Institute of Administration.

**3. Promoting the responsible planning and management of the lands, through the inventory of the land resources and the planning on adequate uses of the land for all the categories of the population, including the one with low incomes, as well as the identification and protection of the ecologically fragile areas;** This objective is achieved through several activities, such as: preparation of real estate cadastre, implementation of urban plans of localities and land use plans of protected areas, accompanied by regulations for responsible management of heritage included. All this depends on the understanding and involvement of local public authorities, mayors.

**4. Ensuring ecological infrastructures (water, sewerage, sanitary services, waste management, internet, etc.);** An ecological technical-urban infrastructure can be realized with the help of specialists, provided that there are programs in this respect. In a sustainable vision, responsible waste management is not done by moving it from one place to another, but by total recycling and full recovery of useful materials.

**5. Development of energy efficient technologies, alternative or recoverable energy resources and sustainable transport, including by expanding the common and non-motorized;** The use of energy efficient technologies involves the gradual abandonment of dirty fuels (hydrocarbons) and the development of the use of solar and wind energy, etc. Transport, as the largest energy consumer, can be ecologically optimized by extending public and non-motorized transport (bicycles).

**6. Supporting areas threatened by disasters, forecasting and defense against natural disasters, which in the period 1972-1992 caused three million deaths and 800 million people affected, with total losses of up to \$ 50 billion per year;** preventing natural disasters costs less than post-disaster action. In localities, especially urban ones, it is necessary to consolidate all the buildings damaged by earthquakes, but also to protect against floods and landslides.

**7. Promoting activities in a sustainable construction industry;** Sustainable development in construction must be understood in depth, not just in terms of earthquake-resistant construction. Thus, from the point of view of construction materials, a desideratum of sustainable development would be the realization of

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all constructions, either from fully recyclable materials, or from construction materials reincorporated (in various forms) to nature. As construction waste has large volumes, the proposed solution would remove the problem of construction waste.

**8. Development of human resources and building capacities for all the above programs.** Providing the necessary human resources to carry out the listed programs is essential. To this end, training programs for all ages and levels, including lifelong learning, need to be developed through specialized institutions. At the same time, ensuring the construction capacities requires the organization of the necessary material base.

As can be seen, human creativity, through scientific research, can decipher and operationalize the measures needed to implement the eight goals needed for the sustainable development of human settlements, urban and rural. Likewise, for all 40 programs in the Sustainable Development Agenda (Agenda XXI), scientists can predetermine the concrete ways in which sustainable, sustainable development can be achieved in all areas of human activity.

To this end, I believe that the Scientific Sections of the Academy of Scientists should be concerned with formulating the objectives necessary for the effective transition to sustainable development in Romania, providing the necessary scientific expertise.

A recent approach of the European Union, of which Romania is a part, summarized the main desideratum of sustainable development, recently adopted by the O. N. U., through 17 objectives.

The 17 Sustainable Development Goals (SDGs) or Global Goals, assumed by our country together with the 193 UN member states in September 2015, cover a wide range of topics that promote global action in three main areas of sustainable development: economy, society and environment.

The 17 SDGs are addressed to both underdeveloped and developed countries and regions alike. Thus, by 2030, the world's states are committed to eradicating poverty and hunger, combating inequality and injustice, and taking active measures to protect the environment. Here are some of the 17 Global Goals:

1. **No poverty** - Eradicating poverty in all its forms and in any context, as globally one billion people continue to live on the brink of subsistence, with less than \$ 1.25 / day.

2. **"Zero" hunger** - Eradicating hunger, ensuring food security, improving nutrition and promoting sustainable agriculture. Currently, 795 million people suffer from hunger and development policy experts say that if no urgent action is taken, by 2050 their number will reach 2 billion.

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3. **Health and well-being** - Ensuring a healthy life and promoting the well-being of all at any age. This goal focuses on increasing life expectancy, reducing infant mortality and serious diseases (such as HIV / AIDS, malaria, TB, polio, etc.), especially in developing countries.
  4. **Quality education** - Ensuring quality education and promoting lifelong learning opportunities for all. Currently, 103 million young people worldwide do not have access to primary education or are illiterate. Of these, the most significant percentage (60%) is represented by young women or girls.
  5. **Gender equality** - Achieving gender equality and empowering all women and girls. Globally, in only 46 countries do women hold more than 30% of the seats in national parliaments.
  6. **Clean water and sanitation** - Ensuring the availability and sustainable management of water and sanitation for all. 40% of the world's population suffers from lack of water and about 1 billion people do not have access to their own toilets.
  7. **Clean and affordable energy** - Ensuring everyone's access to affordable energy in a safe, sustainable and modern way. 3 million people worldwide still use traditional energy sources, based mainly on coal and natural gas.
  8. **Decent work and growth** - Promoting sustained, open and sustainable growth, full and productive employment and decent work for all.
  9. **Industry, innovation and infrastructure** - Building resilient infrastructure, promoting sustainable industrialization and encouraging innovation. 1.5 billion people in the world do not have access to secure telephony.
  10. **Reduced inequalities** - Reducing inequalities within and across countries. In developing countries, between 1990 and 2010, wage inequality increased by 11%.
  11. **Sustainable cities and communities** - Develop cities and human settlements so that they are open to all, safe, resilient and sustainable. By 2050, more than 66% of the world's population will live in urban centers, especially in regions of Africa and Asia.
  12. **Responsible consumption and production** - Ensuring sustainable consumption and production patterns. Annually, \$ 120 billion could be saved if the world's population used only light bulbs.
  13. **Climate action** - Take urgent measures to combat climate change and its impact. Since 1990, CO<sub>2</sub> emissions have increased by about 50%.
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14. **Aquatic life** - Conservation and sustainable use of oceans, seas and marine resources for sustainable development. The world's oceans represent 97% of the world's waters and absorb approx. 30% of emissions.

The Department for Sustainable Development, a new structure, which operates within the working apparatus of the Government and under the subordination of the Prime Minister, was established by the Decision adopted by the Government with no. 313, on May 11, 2017, published in the Official Gazette. According to the decision, the Department for Sustainable Development is a structure without legal personality financed from the state budget, which monitors and reports to the European Union the achievement by Romania of the 17 objectives set for sustainable development.

### **Conclusions**

The complementarity of the two sciences, management and ecology is beneficial and can provide human societies with the necessary guidance for political decision-making. Provided that politics appeals to science, to those who decipher the possible and desirable future, its attractor, which must be sustainable development, which must no longer only be proclaimed, but followed by qualitative reform of political and economic management, which must be to attract scientists and not just politicians to the leadership at all levels.

Unfortunately, we do not have enough politicians able to capture the opportunities and requirements that can launch Romania on the spiral of progress, effectively engaging in this struggle, with the inertia and the state of retreat in which we find ourselves. Not even experiments are being done and no pilot projects are materializing. We proposed in a previously published material, the launch of a pilot program for sustainable development for the mountainous area of Romania, where poverty and depopulation produce dramatic, often irreversible effects.

## **R E F E R E N C E S**

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