

# THE ECONOMY-ENVIRONMENT INTERACTION IN NICHOLAS GEORGESCU-ROEGEN'S THEORY

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## **Abstract:**

*This paper presents some points of view concerning the impact of economic activity on the environment, society's behaviour connected to resources and its correction, the preservation of life support systems, durable development policies in Nicholas Georgescu-Roegen's theory. The great economist had tried to convince us that the problems we face are complex and serious - and we can't address them in the same way we created them. But the question is "Who wants to solve them and how?"*

*A possible solution is the sustainable development model, which is an attempt to combine growing concerns about a range of environmental issues with socio-economic issues. In the present context we believe that the sustainable development model is one capable to improve things and, therefore, we are convinced that by applying the principle of sustainability we will be able to pass on to human society a new mobilising paradigm dedicated to those who are willing to continue in this spirit.*

**Keywords:** sustainable development, environment, economy, theory

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## **1. Introduction**

I have considered that it is necessary to treat *Nicholas Georgescu Roegen's* theory differently for at least two reasons: the first one is that, unlike other economists, he addresses energy and natural resources issues in an original way and advocates their introduction in economic policies, and the second one is that the proposed solutions meet the challenges of sustainable development, in line with the topic of our research.

The economist adopts a radical attitude towards neoclassical economy, an economy built, in his opinion, on the "realm of wealth" which ignores the fact that certain needs are vital, while others correspond to convenience or luxury, which reduces the economic process to a mechanical and self-sustaining model, without paying due attention to natural resources. The supporters of this economy treat the earth factor only in Ricardo's view, without considering the allocation of natural resources over generations, which raises doubts about the survival of the human species. Moreover, they are content with believing that the market mechanism can solve any environmental crisis. The same arguments are brought against Marxist economists who treat the economic process "as a complete circular and autonomous ensemble."

## **2. The return to nature**

Relying on solid arguments, *Roegen* shows us that „the economic process and the material environment influence each other permanently, generating history” (Georgescu-Roegen, 2006) and reduces the relation between to five main categories: the influx of ambient energy, the influx of matter, dissipated energy, dissipated matter and residue. The latter category includes elements such as fallen rocks or nuclear waste, which, although not necessarily completely dissipated, can no longer be used in the economic circuit.

Man has always hoped to be able to "control" Nature, and throughout history he has believed on numerous occasions that he had succeeded. The unprecedented achievements of the industrial revolution made such a big impression that the general attention was focused on enterprises and the wave of scientific discoveries made many overestimate the powers of science which they believed capable of finding solutions to counter the effects of diminishing resources. The discovery of electricity led many to believe that we no longer

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depended on low entropy, that we had found a perpetual force, the wave of optimism growing with the widespread use of atomic energy. In the context of the belief that science can help us eliminate the limits of the environment, it should come as no surprise that "nobody has realized that we cannot produce «better and larger» refrigerators, cars or jets without producing «more and greater» waste" (Georgescu-Roegen, 2006).

The economic development of the last two centuries has forced man to increase the exploitation of natural resources at a staggering pace, has maintained the population growth, which required *the large-scale mechanization of agriculture*, eliminating the farmer's traditional partner, the draft animal. In this way, the solution found for producing more food must be considered in the long term as "anti-economic" since "the ox or the buffalo, whose mechanical power is generated by the solar radiation taken in by the photosynthesis of chlorophyll, is replaced by the tractor, which is produced and operates based on low Earth entropy" (Georgescu-Roegen, 2006), thereby producing a waste of Earth's entropy. To that effect, in line with the requirements of sustainable economy, the proposed solution is *organic agriculture*, which should be based on its own products and develop outside the use of chemical fertilizers, which *should be less and less intensive* to allow the natural regeneration of the soil.

One of the most important environmental problems of mankind, the economist believes, is the relationship between the quality of life of a generation and that of another one, that is *the distribution of human patrimony among all generations*, including the resources that each of them receive. The economy is not able to meet such challenges since it manages limited resources for one generation only. "Every generation can use an unlimited number of land resources and can pollute to any extent, because it is the only bidder. The future generations do not exist on the present market, thus creating "the dictatorship of the present over the future". Generally, when we refer to future generations we only consider our children or our grandchildren, at most, leaving out of the equation the generations of the next millennium or those further into the future. The only way to protect future generations is *to re-educate ourselves*, to refrain from "unnecessary" damage so long as market mechanisms cannot protect mankind from the ecological crises of the future, even if, mathematically, we could find *the fair price* of resources.

### **3. The minimal bio-economic program**

The minimal bio-economic program proposed de *Roegen* takes into account the management of limited resources in the context of the drastic shortage brought about by industrialization and comes up with solutions bearing the mark of the originality of his analyses. Some of the points that ought to be included in this program are detailed below.

*Firstly*, to ban the manufacture of any war equipment; "nations that are so developed nowadays as to produce weaponry should have no difficulty in reaching a consensus regarding this prohibition, if they are wise enough to lead the whole world" (Georgescu-Roegen, 2006).

*Secondly*, underdeveloped countries must be helped to lead a better life, and the productive forces freed from the manufacture of weapons of any kind could be channeled in this direction.

*Thirdly*, the population should shrink and reach a level where it can feed based only on organic agriculture.

*Fourthly*, energy waste of any kind should be avoided, until the use of solar energy is wide-spread, becoming a common fact. The economist sees the possibility for man *to turn his technology and economy towards the energy coming directly from the sun*, even if the solar radiation that reaches us is weaker and the high cost of solar installations is a symptom of the low efficiency of direct solar energy. We are waiting for a new Prometheus, the Third, to solve the present crisis, such as Prometheus II solved the one from the wood age. Roegen believes that the technology developed after Prometheus refers

to the wood age, because wood was the only source of heat energy for centuries, and Thomas Savery and Thomas Newcomen, the inventors of the steam engine, are generically called Prometheus II.

*Fifthly*, man will have to give up any extravagance, such as golf carts or enormous cars; as soon as we did that manufacturers would cease to produce such facilities.

*Sixthly*, we should get rid of fashion, "that disease of the human mind", stop throwing away clothes or furniture pieces as long as they can serve their specific function. If we all gave up on fashion, manufacturers would focus their efforts on product durability.

*Seventhly*, the life of goods ought to be extended by the possibility of repairing them, thus becoming more durable.

*Eighthly*, we should cure ourselves of the "razor syndrome", which means to make a razor which shaves faster to have time to work on a machine which shaves even faster and so on endlessly. Only by giving up such ambitions can we start to spend our leisure time more intelligently, enjoying more what life already offers us.

#### **4. The economic myths**

All of Roegen's research and analyses are under the sign of *the entropic nature of the economic process*. His permanent concern is whether mankind can follow a program involving a constraint of the dependency on the exosomatic system. To that effect, the economist reminds us that only the human species can use and produce exosomatic organs, namely detachable limbs such as bats, hammers, knives, cars, airplanes etc. He ironically wonders whether the destiny of mankind is to have a short, but fierce, exciting and extravagant life rather than a long, uneventful and vegetative life, leaving other species, such as the amoeba, that have no spiritual ambitions, inherit an earth bathed in abundant sunshine.

Showing that *the true result of the economic process* is not a material flow of waste but an immaterial flow: the *joie de vivre*, the economist discusses *the economic myths* that "betray man's great folly, his inner compulsion to believe that he is above all in his current universe and that his powers know no limit "( Georgescu-Roegen, 2006). The debunking of these myths is based on the belief that mankind is not eternal and on the other conceptions of his theory about matter and energy, the finiteness of resources or the fact that the economic process is an entropic one.

The *first myth*, that *of the price mechanism*, considered as most important by the researcher, starts from the idea, put forward by some economists, that no ecological crisis can be generated by the market, that the market mechanism will prevent the depletion of natural resources by rising prices to a level where the demand for them disappears. Moreover, some economists were of the opinion that as the price of resources increases their due to their increasing depletion other factors will replace them in production (Solow, 1974). Bringing a number of arguments related to the problem of resource allocation among generations, to the fact that future generations do not participate in bids that set the current price of resources, that the money price of resources is an 'invention' of man, not a condition imposed by nature and making reference to historical evidence, the economist shows that the price mechanism cannot defend the environmental interests of mankind. He also opposes the principle of the polluter pays, which he considers inadequate, because "a large part of pollution, such as the extraction of deposits [ ...], has no price, [ ...] it is much more important that, if we apply this principle to crime pollution, then it really makes crime payable!" (Georgescu-Roegen, 2006).

The *second myth* refers to the power of technology to solve any dispute between the human species and the environment. Even if in the last hundred years we notice that indicators measuring economic growth have been positive and mankind has enjoyed countless pleasures, it is not necessarily the case that history repeats itself, and that we

should "sleep tight" believing that an economic authority will ensure growth economic, which will be continuous and everlasting.

To the above he adds *the myth of the entropy piracy*, according to which "perhaps the most insidious way to nurture the impulsive hopes of a world is to believe that energy will be free (or almost free)" (Georgescu-Roegen, 2006), a misconception proved by those laws of thermodynamics governing energy conversion.

Roegen's complaints are also related to the fact that the public generally speaks only about the energy crisis, completely ignoring the issue of the matter, the dogma that "any metal object can be produced only by energy in a process that could be generated by a full consolidation of all production processes" (Georgescu-Roegen, 2006), which means a complete recycling, without environment matter input and waste output, generating a perpetual motion, impossible in his opinion, and not only his. Regarding the matter, he concludes that it matters too, that "transactions between the economic process and the environment must necessarily consist of an accessible matter also to compensate for the continuously and irrevocable dissipated matter" (Georgescu-Roegen, 2006).

Concerning *the myth of salvation through computers* the economist believes that it is not possible to program computers so as to find an answer to all our questions, to accept predictions about supply or demand values, to think that this "toy" can solve the environmental crisis. It is not sufficient to determine the change in attitude by rationalizing energy and matter consumption.

## 5. Conclusions

Mankind has become aware that the intensity of human activity increases the pressure on the environment, either by uncontrolled consumption of resources and space, or by generating waste that nature cannot absorb. Individual awareness, however, will appear only when the effects of the degradation of the relationship with the environment will have a direct impact on them, as in the case of floods, hurricanes and other natural disasters hard to predict. The gravity of the phenomena and their increase on longer periods of time and on increasingly larger geographical areas, will likely be the point of convergence between the interests of the individual, government policies and international bodies which should be more active in this respect.

As regards the *materialization of Roegen's proposals* we would like to be optimistic, but, filtering his analyzes through our own reason, we can't stop from borrowing at least a small part of his general pessimism. The reality around us makes us believe that only when natural resources have finished, will policymakers give up on their propagandistic attitude and will no longer merely raise alarm signals. Compared to the minor achievements so far, we will all embark on great things, but will it be too late?

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