INTERACTIV ROLE OF INFORMATION

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Abstract. *In nature, between the biotic and abiotic there are certain types of interactions that generates one of their strange behavior. The study of these interactions requires an interdisciplinary approach*.

Keywords: Information, interaction, biotic and abiotic systems

The existence of interactions between the biotic (living systems) and abiotic (non-viable systems), components of the environment, means at one time occurrence of a certain kind of relationship between these concerns at the interface of disciplines like biology, physics, ecology, hydraulic, cybernetics, biotechnology, thermodynamics, etc.

Issues such systems is required for interactions in the environment and to find the answer in the energy and the information systems. This behavior can be defined in terms of simple or complex phenomena that these systems they generate.

Here and the difficulty of explaining, to find the calculation of mathematical relationships or identifying them.

In other words, to deepen knowledge on the behavior of energy in support of information systems biotic and abiotic, assumes the role of information in understanding the interactions that occur between these systems and the environment.

Meanwhile, a hydrothermaldynamics want to explain the definition of order in these systems, the specific phenomena of the two sciences, and other sciences studying systems with many components (subsystems).

The most studied examples of order or disorder in the sequence in order are: the structures of the thermal conductive fluid or not, the electroconductive fluid at high temperatures, instability thermalelastic, crystal growth, lasers, chemical reactions, deformation of thin plates, aerospace engineering,

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computers, formation recognition by machine, safe systems of unreliable elements.

In classical thermodynamics, in the case of static equilibrium or irreversible processes, the link between different levels of micro and macro states system and replace the order with the mess being made by entropy. In all other sciences, entropy is taken place, ultimately the information.

Addressing this issue without claiming to exhaust (but, only to launch several new hypotheses to explain in terms of hydrothermaldynamics of relationships between environmental factors), I tried to set new coordinates in the field of interface between hydrodynamics , thermodynamics and information theory in the living (biotic) and non-viable (abiotic).

Phenomena generated by the interaction of environmental factors have a large area of coverage. Thus, living matter (the biotic) implies a certain structure that carries the attributes of life and that Romanian scientist Eugen Macovski has called a bio structure.

Dead material (abiotic systems) "born" in nature (rocks, natural crystals, etc..), Sometimes the creation of exclusive rights (alloys, synthetic crystals, polymers, machinery, plant, computers etc..) Shows another feature of its structure. Between the biotic and abiotic relationships are interdependent extremely varied and complicated.

Each structure of biotic systems, belongs to a certain level of complexity which is a certain amount of information and organized it into programs capable of becoming involved in the structure, an appropriate amount of energy and specific.

This shows that solving problems of ecological and environmental protection requires the participation of scientists and specialists from the various branches of human concerns: biology, agricultural sciences, pedology and practically the whole range of technical sciences. Interdisciplinary nature of the concerns in solving these problems is more than obvious.

Information theory has not elucidated, so far, the complete mathematical mechanism of generation of information but was able to explain the different ways rigorous application of the results obtained only in telecommunications.

Extending the theory of information was more technical, especially in cybernetics, electronics and informatics.

In the interaction of components of ecosystems, a role play information and energy. In biotic systems, bioinformatics is essential, she participated in the structuring process, that of becoming, and the communication between these systems.

General issues of information we govern, the existing material and spiritual, can be investigated both through mathematical disciplines, as well as in the other disciplines (psychology, ecology, economics, etc.).

The paper addresses an issue of the interdisciplinary theoretical foundation which we have brought new contribution, in this work.

Applicative aspects presented in the paper, is partly the result of our concerns, and may be an argument in explaining theories addressed.

Assumptions and defining essential content of the paper

Currently, global environmental problems and environmental protection have become priority concerns for all makers of nations and international organizations specialized, since you can not conceive the development of demographic evolution of mankind outside the influence of environment.

Demographic explosion, triggered in the mid 20th century, should not be understood as being uniformly distributed over the entire surface of the Earth. It is especially the least developed countries and those in developing countries at the time, concentrated especially in continents like Asia and Africa. Most of these countries benefited from greater accessibility to medicamentaţie and antidăunători (at that time appeared and powerful class of antibiotics penicillin).

Substantial support in this direction they have given and international organizations, achieving the eradication of diseases. This increase in population must be less on account of raising living standards and more on improving nutrition. Population growth has occurred later, as industrial development, the results of "green revolution", the application of specific technology-intensive farming, chemical fertilizers, irrigation, genetic revolution that has been created, mainly hybrids of corn.

Explanation of this recession should be sought in the events that have place since 1989. In this context, it referred to stem conflicts in areas with high density of population (between India and Pakistan, the Gulf war)etc., the disintegration of the Soviet empire (which induced a reduction of the population in Eastern countries) and the occurrence of droughts and devastating floods in various parts of the globe. A particular attention should be paid to the state in which the terrestrial globe today in relation to the situation at mid-century, just as a result of socio-economic development.

During 1960-2009 it was found that a growing world population of 2,3 times corresponded to an increase of 6 times the gross domestic product, 5 times the use of fossil fuels, 3 times the consumption of timber.

Meanwhile, in food production has increased almost 3 times the consumption of cereals and the release of all fish.

At the same time raised above, agricultural production per capita increased from 1.25 times and was an arable land decreased by nearly 2-fold, compared with the existing situation in the mid 20th century. these increases have exceeded the limits but suportasbilitate environment. Chemical fertilizers whose use has grown continuously, which is increasingly challenged by biologists, have soils that have an increased limit of saturation, which can not get something extra, and oceanic fishing exceeded pace already natural regeneration of fish stocks [8].

As a result, they can highlight the following aspects:

• alarming increase in the consumption of fossil fuels as a result of intense combustion, led to the release into the atmosphere huge amounts of carbon dioxide. This has led, among others, along with other pollutants, the occurrence of the greenhouse effect and the expansion of desert areas;

• diminishing green areas as a result of deforestation made irrational, has, inter alia, a reduction in the concentration of oxygen in the atmosphere, and a decreased ability of regeneration. All these actions because of deforestation, led to land degradation (eg in the agricultural sector were removed from the circuit important areas of topsoil) and amplification of torrential leaks;

• overexploitation of natural resources and environmental pollution have led in time to emaciation flora and fauna and biological diversity of Earth, with the track in time nebănuite yet;

• use of water resources, especially fresh water, in economic activities (especially industrial) led to emaciation reserves planet. If you will not find solutions to reduce water consumption for economic, mankind is likely to remain without water consumption required to feed both people and animals and to increase the cultivation of plants and vegetables.

Humanity now faces a crisis economic and general relationships between environmental and economic development of this end of the millennium.

In these crises are mainly generated by the following factors:

• dominance relations conflict, a competition between "strong and weak" within and between human societies for access to resources and basic needs;
• reducing the values to some components expressing increasing quantity and greatness;
• Information processing, knowledge and progress technical objects of property or means of domination and the exercise of power;

• limiting participation in discussion of strategies and action plans and influence of [9].

It is citizens in public life in terms of property and riches they have therefore necessary that strategies and action plans for sustainable development in the economy, to become operational.

Application should have different able to ensure a stable balance [10] mechanisms, instruments and eco technology between the components that define the concept of sustainable development (economic development, technological development, environmental protection and social protection).

Need to address interdisciplinary

Of those listed above, it follows three major objectives that should be fulfilled to optimize human activity and to save the entire system of biotic extinction:

a. untainted preservation of the environment and the prohibition of polluting activities in order to avoid environmental degradation;

b. a substantial reduction of consumption by burning fossil fuels, enhancing control over exploitation of timber resources, to enable the regeneration ability in time and not to go to soil degradation (eg, through uncontrolled deforestation);

c. reductions of water for other needs than those necessary physiological creatures. Water and light are essential elements of life and should be

considered first, biological sources. Danger that should be avoided before they no longer have what we eat, to dispense drinking water, which would inevitably lead to the extinction of life.

Solving the problems of interdisciplinary specialists assume from their communication skills and knowledge in the area to enable them to identify the most effective solutions.

This includes training in time. Unfortunately, educational establishments, even those that form the ecological, have a capacity of training quasi unilateral.

As in any field but especially in the ecology and environmental analysis are to the finest detail, and operations summary, with the conclusion, materialized in various forms: from the definitions indicators base of different phenomena.

Thus, eco sphere (from the Greek oikos - house, root word ecology), is defined as all [5], and the live-non live interaction at the planetary, or whole ecosystems ecosystem is a unit resulting from interactions between biotic community and habitat (biotope) them on a well defined spatial unit.

Biotope should be understood as a limited area (forest, river, steppe, lake, sea), i.e. all ecological factors constituting the external (physical factors, chemical, geological and climatic) in which different species of live plants, animals and micro-forming biocenose.

Biocenose, in turn, means all living organisms (biotic systems), characterized by a specific composition (biodiversity) due to the existence of interdependent phenomena (of which the nutrition is essential), but also brought together by mutual attraction exerted by factors abiotic (physical environment) biotope characteristics respectively.

Whole living organisms which constitute biocenose consists essentially of:autotrophe creatures (plant capable of photosynthesis and chimiosyntesis), which convert inorganic matter into organic matter to the world live prepare and feed themselves; creatures heterotrophe, organizations which manufactures single-and food, whereas a ready prepared take (consume creatures autotrophe).

They are all macro-consumers (consisting of ierbivore animals, carnivore and omnivore animals, including man) and micro-consumers (saprophytic organisms that decompose dead organic matter, retaining their part - that recompose - and return the rest as mineral products, to prepare a new course for creatures autotrophe).

Building functional ecosystems with the two essential components - the synthesis of organic matter (represented by all organisms autotrofe, producing

organic matter of life and potential energy) and the analysis and utilization of organic matter (consisting of all heterotrophes, this component using potential energy and mineral matter returned items that have entered into the composition of living matter) - ensure restoration of mineral fund living environments.

Ecology is the biological discipline which has as its field of study the interaction between living organisms (in the range of creatures at superindividual, group) and their living environment. In other words, ecology provides both an integrated picture of all forms of existence of matter and its interactions with the environment.

In ecology, shows that the main phenomena of interdependence in the biocenoses are feeding. All living organisms (biotic systems) living on the others, while consumer and food, in a sequence in which food travels from the primary trophic (plants) and consumers to peak on a pyramid (Pyramid eltoniene): the producers (plants), primary consumers (ierbivore, insects), tertiary consumers (carnivores, birds) to a lower peak and consumers (animals that feed on carnivores, hawks, eagles, parasites), are in a relatively small number of copies. It can thus deduce that the life cycles of biocenose no concept of waste. Waste individuals from a trophic level (including death, are subject to biological degradation micro-consumers), individuals become food for other trophic levels. Thus, at the climax (relative stability) of an ecological factors constituent "cooperate" in harmony, making a perfectly synergistic. Ecosystems can therefore be considered as systems of reference synergistic, science has self- organization or self-structuring systems, regardless of their nature (physical, chemical, biological, social), based on working together, cooperation organic components or subsystems constituents [4]. Formation synergistic that science, by the german physicist Hermann Haken in the early 70s, leaving, in fact, the research of Ilya Prigogine, which show that life is not outside the natural order, but appears as an expression of processes the self generated just because of this [3], [7].

Information on environmental movement

What characterized the biotic systems essentially in relation to other components of ecosystems is cyclical movement, continuing the species individuals (birth, growth, maturity period, death), but their mobility and in space during life, depending on the characteristics of these species. Even plants present forms of fluid motion in the space outside the ground, which can be regarded simply as a medium in which they are fixed. Movement biotic systems takes place in the fluid (water, air) in which they live and through which "communicate" in different ways with other biotic and detect sources of

food, water, etc. peril. In other words, biotic systems are endowed with specific capabilities of information and communication you use continuously throughout the period of life [1].

Three main types of information characterizing the biotic (living matter) in individuals of species [6]:

a. genetic information, hereditary, is the huge amount of information that is included in all skills that are transmitted from generation to generation individual species. Following this information, the seed "know" how and under what circumstances, germ and develop, the female "knows" how to care and chickens, animals "know" and how to seek food, water sources, to protect from hazards etc.. b. energy information, energy processes associated with biotic system, open system, made a continuous exchange of energy with the environment in which he lives, from the processing power, mainly from food and environmental disposal of residual energy. This complex processes occur endo and exo energy, such as entropy, the thermal component of their plays a crucial role. Thus it follows as a consequence of the interaction energy-permanent information [2].

c. Information related communication with the environment and other systems of biotic ecosystem, a process taking place, also on a continuous basis throughout the life of the biotic systems. In every moment of life, the sense organs and the extra-sensory own bio-field in interaction with environmental energy fields, biotic system to inform and take in their own needs and limits the possibilities with which nature endowed the measures to ensure their existence (for purchasing food to avoid factors that may endanger the life, reproduction, etc.). Such information is received as a force specific impulse, which is likely to stimulate a response from the receiver. Developments within the meaning of the work, the concept of extension is bio-field biotic systems to more general notion of field. It can be represented as a liability, such as synergistic, cooperative, emissions extra-sensory functions may cover, in whole or in part, emitting electromagnetic nature or gravity and which contributes, along with the other senses to adapt to environmental conservation and default species.

Defining the essential content of the paper Synthesized of the above, it can be seen that:

a. The premises is the ambient fluid through which the heat exchange processes result in energy (food-residues) of biotic systems.

b. The study of the biotic interactions between them and their life can be:

• supraindividual level (population, biocenose, biosphere) in the overall behavior of the biotic systems, in relation to the environment in which they live;

at the individual species, as bio-field relationship between them, respectively, between energy and environmental fields.

c. By their capacities bio-detection (essential attribute of living matter), the biotic receives through the sense organs (the interface) or by the extra-sensory information on the nature referred to in § 1.3 / c, through which (biological limits duration of life of individuals species) take appropriate measures to survive.

d. Information is propagated between the point of emission (environmental or biotic systems) and receiver (the biotic) fluid spaces in environmental (air, water), but also by physical fields.

Regardless of how propagation (convection or undulatory) or its nature, study the role of interactive information fluents between environmental and biotic systems, requires a synthetic theoretical approach. This study is dedicated to the next chapter (the second), from the theoretical movement of fluids and rest, as
the average carrier information is then presented in sequence, elements of similarity and analogy with the propagation of information, regardless the nature (physical, chemical, electromagnetic them under different forms of manifestation: electricity, light, radio etc..) and the summary results.

Consecutive this chapter we address the appropriate methods of calculation and we substantiate a number of theoretical developments. Theoretical aspects of the issues addressed leading to the conclusion that both biotic systems and structures of the components of the abiotic environment can be attributed qualities are characterized by an apparent dualism-energy information. Thus, we found that these systems can be called generic energy-informational systems, and phenomena generated by these systems can be called information-energy phenomena.

R E F E R E N C E S

[1] Botnariuc, N., The evolution of biological systems supra-individuals, Bucharest University Publishing House, 1999, p. 91-97.

[2] Constantinescu, P., Synergy, Genesis and information systems, Technical Publishing House, Bucharest, 1990

[3] Georgescu, A., Synergistic, a new synthesis of science, Technical Publishing House, Bucharest, 1987.

[4] Haken, H., Synergetics, Editure Sprinager Verlag, Berlin, New York, Tokyo, 1978.

[5] Măruţă, A., Chiriac, V., Current Problems of water in agriculture and food, Editura Ceres, 1981.

[6] Măruţă, A., Bio-geo-physical Publishing Company "Romanian Athenaeum, Ecological University, Bucharest, 1995.

[7] Nastase, I., G., The role of interactive information Rapanui Publishing House, Bucharest, 2002, p. 7-9.

[8] Purice, I. Synergistic, a meta-science?, No Power magazine. 2, 1987.

[9] Vadineanu, A., I. Sustainable Development Theory and Practice, Bucharest University Publishing House, 1998.

[10] Vadineanu, A., Black C., Lisievici, P., Sustainable Development II - Mechanisms and instruments, Bucharest University Publishing House, 1999.