

ECOLOGICAL CRISIS CHALLENGE AND THE NEED FOR SUPRANATIONAL SCIENTIFIC CO-OPERATION

[Professor Dusan Kanazir](#)

f. President, Serbian Academy of Arts and Sciences

Yugoslavia

*"Happiness resides not in possessions and not in gold;
it dwells in the soul."
Demokritus*

Europe, especially Eastern Europe, is today in the process of interaction among the old civilisation and the new, and in ecological disaster due to the rush for profit, human greed, egoism, and the irrational and massive destruction of the environment. The past thirty years of revolution in technology, especially in industrial development, have caused great environmental degradation and even human psychological and moral pollution. World pollution and degradation is today greater than that of the preceding 200 years. Uncontrolled development of industry/technology, which did not respect the laws of nature and biological evolution, not even real human needs, has in many European countries resulted in an exacerbation of the ecological degradation and in a grave economical, social and ethical crisis. The problem, therefore, is neither national nor regional, not even continental; it has global, economic, ethical and cosmic dimensions.

We are buying our comforts now at the expense of future generations by ruining the environment. This attitude is certainly unethical. Our current models of economic development would seem to have no future. Therefore, we have to create a new social and economic order that is in harmony with bios and nature. That means that we have to reconsider, today, our models of economic growth and our attitudes and ethical values towards bios – life – and nature.

The most serious obstacle on the road to further development of the present civilisation, and of ethical values and humanism, is the division of the present world into two irreconcilable camps: one is represented by technologically and culturally developing nations and the other one by under and non-developed countries living in scientific, technological and cultural backwardness, as well as in economic and social misery. The globe is not integrated; despite food surpluses, more than 50% of the human population is starving or dying from hunger, and remains illiterate. The world, as a whole, faces acute problems such as social conflicts, environmental pollution, waste of natural resources, recession, political and military threats, local wars, organised crime and terrorism. The drama of contemporary civilisation is the result of a deep moral crisis, of religious and political/ideological differences, and of the misuse of power, knowledge and technology. The future of life, and even of the human species, on our planet seems to be in question due to human egoistic and destructive behaviour. Is the threat to survival a real one? It seems that all present threats are very real. Therefore, we need a new meaning of humanism, grounded on bio-ethics, culture, education, science, human rights and wisdom for survival. We need knowledge on how to use the latest advances in science and technology for the cultural, scientific and economic benefit of humanity.

Furthermore, our civilisation acts as a selective mechanism that favours selfishness, egoism, aggression and violence. In our case, a fundamental question follows. If the human being is among other organisms and animals the only one dominated by culture, how then can culture and education influence and regulate the expression of genes involved in human behaviour? Can man "teach his genes" to become generous and altruistic? What would be the role of science, education and culture in the attempt to build a new humanism? The individual brain is shaped by natural selection and represents a unique combination of genes. Can we rebel against and free ourselves from the tyranny of "selfish genes" that are the main obstacle in the attempt to build a new model of humanism for the 21st century?

It has finally become obvious that the obstacle to the survival and further harmonious progress of mankind is Man himself. We ourselves, our genes, are the enemy of our prosperous future! The fate of life and mankind does not depend only on overt human assaults upon the environment but also upon human social systems and institutions in general – political government, legal and social structures, cultural and educational institutions, economic and trade arrangements, as well as the increased number of international conflicts and local wars which nations inflict upon each other. The main question is, therefore, whether the present world and national institutions, policy-making and legal structures are intellectually mature and ready to respond to the present world crisis, and what is the role of the scientist in coping with it?

Economy and the bio-environment

The life-supporting environment provides the biophysical necessities of life, namely, food energy, mineral nutrients, air and water. The life-supporting ecosystem is the functional term for the environment, organisms, processes and resources interacting to provide these physical necessities. Renewable natural capital is generated by the continuous interaction between organisms, populations, communities and their physical environment. Species are part of the ecosystem contributing to the production and sustenance of renewable natural capital. For any type of renewable natural capital to be sustained, a minimum number of species is required to develop the cyclic relations between producers, consumers and decomposers. These cyclic relations, in synergy with the environmental conditions at hand, will continuously develop and evolve the structure of the ecosystem. The structure and processes of the ecosystem have to be intact and functioning, in order for it to qualify as renewable natural capital.

Environmental economists speak of natural, cultural, and manufactured capital, when categorising the different kinds of stocks that produce the range of environmental and economic goods and services used by the human economy. Environmental scientists argue that natural capital and manmade capital are largely complements, rather than substitutes, and that natural capital is increasingly becoming the limiting factor for manmade capital and further development. Therefore, in order to sustain a stream of income, the natural capital stock must be maintained.

Technological progress should be increasing in terms of efficiency, rather than increasing simply in terms of bulk; harvesting rates of renewable natural resources should not exceed regeneration rates; waste emissions should not exceed the assimilative capacity of the environment; and non-renewable resources may be exploited, but at a rate equal to the creation of renewable substitutes. In the context of biological conservation and human welfare, the major challenge from this perspective is to maintain the amount of biodiversity that will ensure the resilience of ecosystems and, thereby, the flow of crucial renewable resources and environmental services to human societies. This does not mean that neither ethical and moral concerns for biodiversity conservation, nor the preference of humans for particular species, without information as to their role in the system, is of no importance. On the contrary, this hierarchy of values has to be explicitly stressed in discussions on biodiversity conservation and sustainable development.

New vision for the structure of profit

According to Dr. Agni Vlavianos-Arvanitis, the concept of profit has to be redefined today, in order to include new knowledge on spiritual wealth, preservation of natural resources as a measurable part of a nation's GNP, better health and education, the protection of biodiversity, i.e. elements constituting a "genuine" profit for society.¹ The limited definition of profit needs to be replaced by a comprehensive definition resulting from this new approach, where the values of natural and human capital, culture, education, natural resources, and biodiversity will be crucial factors considered in every definition of profit.¹

It is evident that financially poorer nations may be richer in cultural and ethical values, art, tradition or biodiversity. These elements represent an enrichment for the entire planet and cannot continue being ignored by economists of big powers.² GNP and trade potential evaluations should evolve to include all the parameters mentioned above, and should place special emphasis on the urgent task of safeguarding bios, the bio-environment and natural capital.² On a global level, policies for economic growth, the rush for profit and employment opportunities have to be structured according to these new principles, in order to be more effective in countering poverty, national debts, environmental deterioration and unfair trade developments through the pressure of big powers.

Remedy for the environment

First of all, we have to use our new knowledge and sophisticated methods in order to remedy man-induced environmental alterations. Currently, new perspectives in geotherapy are emerging. Major trends in scientific thinking include: (a) maintaining the basic life support systems and ecosystems – enlarging the range of choices in resource management; (b) refining methods of risk assessment; (c) streamlining methods for monitoring environmental change; and, (d) increasing efforts to examine environments within holistic frameworks.

The health of the land and associated plants, animals and ecosystems is fundamental to understanding the interactions that affect the net ability of the land to support life biodiversity and to produce natural capital.

Handling resource problems is very slowly moving away from single purpose to multi-purpose programmes, especially in relation to water and land management. The risks and profits have to be presented in public prior to decision and policy making. In these decisions, usually cost-benefit analysis is used, but long-term impact on ecosystem biodiversity and on quality of human life is underestimated and neglected. The divergence is nowhere more extreme than in the realm of energy options, where the estimated risk/benefit analysis used in comparing coal and nuclear energy not only divided experts, but provoked a strong public response. It is evident today that the methods of risk assessment and data interpretation should be significantly improved, and, for this to be achieved, wide range scientific investigations are needed. Erroneous economic assumptions and decisions are at the root of all evil.

Genetic engineering as a choice for preserving the bio-environment

Genetic engineering, is, at present, one of the best methods for saving the environment and increasing world food production. With genetic engineering, it will be possible to accelerate plant breeding and confer traits such as resistance to insects, fungi, bacteria, viruses and nematodes. The results will be decreased dependence on agricultural chemicals and an increased emphasis on disease prevention and preservation of the bio-environment. An increased tolerance in plants would enhance productivity on existing farm land and enable poorer land to be cultivated for the first time. Controlling plant protein synthesis and storage systems could lead to the improvement of the nutritional quality of seed grains. This may significantly affect nutrition in developing countries. By controlling the function of plant-growth regulatory genes, planting and harvesting cycles can be altered, permitting growth of more than one crop without applying agricultural chemicals. Hybridising major crops, such as wheat, soybeans, and rice will result in hybrid vigour that could increase world crop yields significantly and improve their quality. Ultimately, through genetic engineering, plants may even be led to produce raw materials for the chemical industry, such as latex from rubber plants, oil from palms, starch from corn and other crops, sugar from sugar cane, cellulose and lignin from trees. All of these principal chemicals derive from agriculture. A great variety of environmental problems, including the problems of preserving biodiversity through genetic banks, can be solved by this method.

Genetic Banks

The role of Genetic Banks³ in wildlife conservation efforts has long been considered of great importance.⁴ Preserving the genetic material of endangered plant and animal species can help restore genetic diversity in these species and significantly contribute towards protecting biodiversity on our planet.⁴ Along the same lines, the B.I.O. has been promoting the establishment of "local" Genetic Banks as a means of protecting the enormous wealth and diversity of endemic wildlife.⁴ These banks are now in operation in Yugoslavia. The information stored in them will become available on computer databases and be distributed world-wide. As a result, conservation efforts could be better co-ordinated and the urgent task of preserving biodiversity would be accelerated.⁴

References

1. Vlavianos-Arvanitis A. (1995) *Biopolitics: A shift from anthropocentric to biocentric values in business*. In: Vlavianos-Arvanitis A. (ed) *Biopolitics – business strategy for the bio-environment I*. Biopolitics International Organisation, Athens, pp. 8-9
2. Vlavianos-Arvanitis A. (1998) *Biopolitics – the bio-environment – building a biocentric millennium society*. In: Vlavianos-Arvanitis A. (ed) *Biopolitics – the bio-environment VI*. Biopolitics International Organisation, Athens, pp. 39
3. Kanazir D. (1993) *Bioethics, survival and global drama*. In: Vlavianos-Arvanitis A. (ed) *Biopolitics – the bio-environment IV*. Biopolitics International Organisation, Athens, pp. 82
4. Vlavianos-Arvanitis A. (1996) *The bio-environment - bio-culture - bio-peace for the next millennium*. In: Vlavianos-Arvanitis A. (ed.) *Biopolitics – the bio-environment V*. Biopolitics International Organisation, Athens, pp. 59

Professor Dusan Kanazir, former President of the Serbian Academy of Sciences and Arts, and former Minister of Science and Technology for the Government of the Republic of Serbia, studied medicine in Paris and received a Ph.D. in physiological sciences from Université Libre de Bruxelles. He has been Professor of Biochemistry on the Faculty of Sciences at Belgrade University and Scientific Counsellor at the Boris Kidric Institute. He has taught in the USA, Japan, Belgium and Argentina, and has been inducted in numerous learned societies, academies and boards. Appointed Commandeur de la Légion d'Honneur by the French government, Professor Kanazir has also earned the Decoration of Merit for the Yugoslav Peoples – Gold Star – the Plaque of the Institute for Nuclear Energy Application in Agriculture, Veterinary Science and Forestry, and the Decoration for Work – Red Flag – on two occasions.