# BIOPOLITICS – BIO-CULTURE

# A MILLENNIUM VISION FOR PEACE

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*"Bios may serve as a lever*
*to lift the spirit of the world."*
***A. Vlavianos-Arvanitis, 1985***

**Bios – a vision beyond sustainable development**

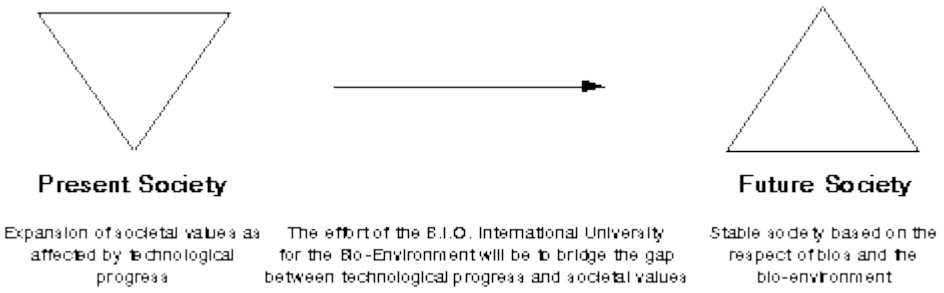
Human actions are interfering with global-scale properties and processes in ways that have resulted in a serious crisis in values. Environmental deterioration is threatening the very continuation of life on our planet, adding urgency to the need for coherent long-term international strategy and co-operation.

The emerging process of globalisation profoundly illustrates the necessity for rigorous inquiry into the opportunities and challenges ahead. A range of problems are confronting humanity and are affecting the development of national states, economic markets and local communities throughout the world. Increasingly, with information and communication technologies empowering individuals everywhere, humanity's future rests with new models of thought, action, communication and participation. A millennium vision in policy – bio-policy – can guarantee the continuity of *bios* (life) on our planet and lead society to a harmonious future.

Since its inception in 1985, the Biopolitics International Organisation (B.I.O.) has been promoting the concept of bio-culture as a powerful unifying factor for the future co-evolution of humanity with the environment and for the harmonious co-existence of all forms of life. Bio-culture provides the necessary incentives for every endeavour to be governed by "biocentric" principles and orient toward the better understanding and preservation of the environment. In the spirit of bio-culture, every individual on the planet is encouraged to actively engage in the search for new paradigms and to join environmentally committed legislators, scholars, educators and business leaders in influencing governmental regulation of environmental issues around the world.

To alleviate regional conflicts and reconcile environmental harmony and economic growth, new policies in industry, energy, transport, agriculture and regional development must be emphasised. In order to be successful, however, these policies have to be based on a framework of environmental ethics. Bio-culture provides these ethical guidelines and urges a reassessment of current assumptions with a view to a global appreciation of bios.

Society needs to mobilise every one of its elements and strive for a better future. We are now consumed in an inverted pyramid structure, where nothing is in balance because the right priorities have not been set. The pyramid may once again become re-inverted once we acknowledge the value of basing the entire structure of society on biocentric principles.




Working to sustain what already exists is not enough. With new challenges constantly arising and with an increased awareness of the urgent need to take action against destructive trends, the time is ripe to find more comprehensive, long-term solutions to protect our planet and guarantee a balanced society for the future. A new vision, "beyond sustainable development," can help place the situation in perspective, and provide the necessary incentives to move ahead and explore possibilities leading to more just and safe global management.

To reach a new state of the world, education is key. The International University for the Bio-Environment (I.U.B.E.) – an initiative which actions the B.I.O. aspiration for global environmental literacy – is a catalyst that can infuse society with models for creative and thoughtful action. It provides a new educational challenge, fighting the trend towards over-specialisation and seeking to open up all areas of study and training to an appreciation of life on our planet.

The current crisis in values is a great threat, not only to the environment but also to peace. This is why there is a pressing need to use the diachronic ideals of the past to motivate every member of society towards the conservation of the environment. The Olympic Spirit can play a leading role in uniting the forces of culture and technology to instil the appreciation of the aesthetic value of life on our planet. Bios Prizes for each speciality, with the participation of every individual and of every profession is one of the B.I.O. goals for the new millennium. Through a truly international and multidisciplinary environmental education, every citizen of the world can contribute to the spiritual renaissance of humanity.

**Bio-diplomacy – an international effort in defence of the environment**

One of the main B.I.O. goals is to promote the environment as a vehicle for international co-operation and peace. Within this framework, bio-diplomacy – international co-operation in environmental protection – is actively pursued.

Bio-diplomacy is a concept pioneered by B.I.O. at a time when civic leaders, international organisations and the world community as whole had not fully realised the urgency of adopting common environmental policy as a priority. It focuses on the interdependence of all forms of life and calls upon diplomats and people of influence to engage in a collective endeavour in defence of the environment. Joint efforts to protect the environment can enhance international relations and act as a bridge between global impetus and decision-making at the national and local levels.

Bio-diplomacy is an opportunity for the aspirations of sovereign states and civil society to converge in pursuit of long-term international environmental policy and action. At the same time, bio-diplomacy actively supports efforts to maintain biological and cultural diversity and seeks to improve human relations and to attain the goal of world peace by replacing current diplomatic attitudes with a complete international and intercultural perspective.

Environmental threats are international problems. The required solutions entail the development plans of action for peace and international understanding. Nations should no longer be at war with each other but, with environmental destruction and abuse. Foreign policy should thus shift from a fragmented, competitive framework to a vision of unity and interdependence.

Over the past sixteen years, ambassadors and dignitaries from dozens of countries have pledged their support of this B.I.O. initiative and have joined in many conferences and symposia aiming to strengthen the role of bio-diplomacy.

Bio-diplomacy espouses the belief that cultural differentiation constitutes the wealth of the body of humanity. Humanity is part of the overall body of bios, where DNA, the genetic code for every living organism, is the link connecting all forms of life. Trees, the source of oxygen on our planet, can be considered the "lungs" of the body of bios. Damage to the lungs is not an isolated event but results in the whole body suffering.

To encourage international co-operation the world needs to stop investing in war and start investing in the environment. Competition for ways to destroy, should become co-operation for ways to save. Without interfering with vested interests, the greatest challenge for the 21st century should become the development of new ways of channelling current defence protocols so as to adopt the principle of "defence for bios" as the primary national and international priority. Existing defence equipment can be amended and used for reforestation, water resource clean-up, soil erosion recovery, protection of the ozone layer and the de-contamination of areas affected by nuclear radiation.

**Bio-education – the International University for the Bio-Environment**

With the advent of globalisation, a major change in economic, social and educational priorities is shaping world views and ways of life and is creating new challenges for humanity. To meet these challenges, education for the new millennium requires a radical shift away from intra-disciplinary entrenchment and into creative and thoughtful action for the development of the highest potential of each individual for the benefit of the world and future generations.

The purpose and responsibility of bio-education, as promoted by B.I.O. since 1985, is to uplift the spirit of humanity and to reverse the crisis in values that has resulted in serious environmental deterioration. By providing interdisciplinary models with the environment at the core of every speciality, bio-education seeks to apply environmental protection to every human endeavour.

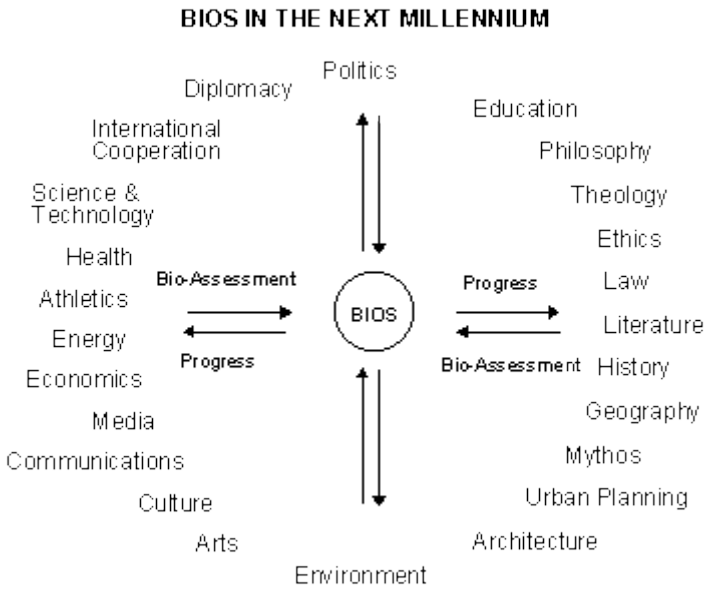
To further this vision, B.I.O. launched the International University for the Bio-Environment (I.U.B.E.) in 1990. The I.U.B.E. urges scholars, decision-makers, diplomats, business and civic leaders to actively contribute to the development of a biocentric society. Bearing in mind that universities should be, by definition, "universal," the International University for the Bio-Environment (I.U.B.E.) promotes a model bio-education by introducing interdisciplinary educational reforms on a world-wide basis.

Rather than focusing on the award of degrees, the I.U.B.E. acts as a catalyst to accelerate environmental awareness and impart a biocentric message to opinion formers, students and training professionals around the world. It is based on a visiting scholars programme, whereby leading educators and decision-makers infuse existing educational institutions with bios promoting values. The aim is for the I.U.B.E. to become a world-calibre initiative for the development of multidisciplinary environmental concepts, beyond the confines of conventional environmental science, leading to a revised educational system for the entire planet.

The principle goals of the I.U.B.E. include:

- international educational reforms and the promotion of an efficient global bio-education with the use of the Internet and satellites. Within this framework, e-learning is encouraged.
- the development of a comprehensive *Bio-Syllabus* for every educational level demonstrating how environmental concepts apply to all academic areas
- international co-operation in environmental protection leading to a new era of bio-diplomacy
- international legislation on bios rights and human obligations towards the environment
- the re-evaluation of business and management concepts and the development of new economic strategies compatible with environmental preservation
- raising public awareness of the ramification of the biological sciences

- an international campaign for Environmental Olympics and the award of Bios Prizes to individuals or institutions that have contributed to the preservation and appreciation of the bio-environment




- a global bio-assessment of technology, to ensure technological and economic progress that support the bio-environment, and to help bridge the gap between technological progress and societal values. In reference to the issue of "Bios in the New Millennium," experts in respective fields will be asked to present a thesis and antithesis, and then create a synthesis of new concepts. Emphasis will be placed on identifying ways of reducing negative environmental impact, so as to truly benefit from the contributions of technological breakthroughs.

The I.U.B.E.'s pioneering *Bio-Syllabus* is already part of the curriculum of numerous university courses in an expanding list of countries. It provides themed references to the highly regarded and wide ranging resource of published B.I.O. material, freely available to both educators and the educated, in print and electronically – on the Internet and on CD-ROM.

*Why is bio-education essential?*

The understanding of changing environmental circumstances and of the fluidity of the concept of environmental protection requires the development of a critical appreciation of the numerous influences affecting the interactions between humanity and the environment. Environmental pollution is an international problem and a matter of vital importance for all. Concern over environmental questions is an international task, particularly for highly developed, industrialised countries. We must acknowledge our individual and social responsibilities and the fact that environmental protection involves confronting conflicting interests. There is a need to balance environmental and economic priorities in order to achieve safe and just global management. Bio- education consolidates awareness of the importance of incorporating the environment in every human endeavour and enables the realisation of the interdisciplinary nature of environmental protection.

Stressing the international character of environmental problems and the multidisciplinary nature of the environment is a priority in bio-education. The environment is an integrating concept referring to the sensitivity, experience and culture of each member of society. Environmental quality and quality of life are inextricably linked. Human rights violations, disease, hunger, lack of safe water resources and poverty are more common in areas of severe environmental abuse. Health problems linked to the environment, food subsistence and access to culture and general welfare, including security and peace, are some of the challenges to be faced.

Bio-education should be disseminated as widely as possible with the assistance of educational institutions, businesses, municipal authorities, governments, NGOs and other stakeholders. By promoting joint action in all sectors of society and the economy, a broad consensus about the development of an environmentally-responsible citizenry can be built.

The need for good quality training for teachers involved in bio-education cannot be over-stressed. Current inefficiencies in teacher training could pose serious problems in the future. Teacher training projects helping the introduction of environmental curricula into classrooms should be encouraged, while networking should be promoted on a world-wide level.

Teachers must also be encouraged and trained to use methods in which students become agents of their own learning by being truly involved in the learning process. The learning process has to be flexible and interactive so that students become independent and develop their own sense of initiative, responsibility and commitment.

Bio-education is an interdisciplinary subject of relevance to many fields of teaching. Given the complexity and the various levels of relationships with society as a whole, a wide range of subjects can contribute to bio-education. Educational institutions should therefore be encouraged to devise their own bio-education profiles, based on their strengths and the overall focus of their activities. The non-exclusive approach of bio-education is an opportunity to lift the barriers separating different disciplines and to offer a well-rounded education which is not hampered by overspecialisation.

New programmes and curricula should be designed with this in mind, with the necessary adjustments in timetables and agendas. The promotion of bio-education in business, public administration and government should also be emphasised. Programmes for vocational training and seminars for decision-makers are absolutely necessary if environmental awareness is ever intended to produce action.

**Bio-economics – redefining the concept of profit**

In view of the heightened contemporary understanding of the close relationship between the environment and development, economic actors are key players in the drive to tie business to environmental protection. Preserving the wealth and beauty of the natural world, securing the health of the Earth's population, providing fair rules of trade, and guaranteeing equal educational opportunities for every country in the world can be a source of genuine profit, both monetary and social. The issue of "quality of life" needs to assume top priority, along with culture and education. Moreover, the concept of profit has to be redefined and encompass elements which constitute a "genuine" profit for society: culture, internal wealth, preservation of natural resources, better health and the protection of biodiversity, as a measurable part of a nation's prosperity.

The world is experiencing a range of hurdles with regard to seeking a compromise between the legitimate needs of development and the fragile environmental balances. Poor countries overuse their resource base and, thereby, their natural environment. The sale of raw materials in oversaturated markets leads to falling prices, which in turn reduces net proceeds. Because of such conditions, appeals to protect the environment are ignored or often met with derision. The conflict between the industrial countries' ongoing economic growth and the developing countries' undisputed need for growth, on the one hand and, the negative environmental effects of energy and raw material intensive utilisation on the other, cannot be solved within the present framework.

Environmentally-sound guidelines are discussed and arrogated at the negotiating table, but in real life directives all too often do not reach national decision making. An approach combining the consensus and consent of the people, as well as that of governments and international institutions, is essential in order to prevent economies from expanding without due concern for the environmental repercussions of uncontrolled growth. Corporations and entrepreneurs can work together to tackle these challenges and tread lightly on the planet in their business endeavours. At same time, a grassroots mobilisation and public participation, on both the local and international levels, can enhance the establishment of bios-supporting economic strategies and initiatives world-wide.


*Three dimensional economics*

Conventional business and national accounting are inadequate for the implementation of long-term economic policies. Economic growth is largely being measured in terms of goods and income categories only, while the effects of this on the stock and quality of resources – natural capital – are not adequately considered. Traditional economics approaches are generally limited to "two-dimensional" analyses. However, this current fragmented and limited picture of economic theory needs to be replaced by a "three-dimensional" approach, where the value of culture, human capital, education, natural resources, and biodiversity will factor in every equation and diagram.

Financially poorer nations may be richer in cultural values, art, tradition or biodiversity. These elements represent an enrichment for the entire planet and cannot keep being ignored by economists. Evaluations of GNP and trade potential should therefore evolve to include all the above mentioned parameters and place special emphasis on the urgent task of safeguarding the environment. Policies for economic growth and employment opportunities, on a global level, can be structured according to biocentric principles and thus be more effective in countering poverty, national debts, environmental deterioration and unfair trade developments.

The goal should be to eliminate current inadequacies in financial trends and guarantee economic prosperity for every country in the world. Moreover, the goal should be to ultimately render the concept of a "Third World" obsolete and, through enhanced communication, trade and co-operation reach a desired state of world equilibrium in both economic and sociological terms. Humanity cannot prosper from destruction. Guaranteeing a better quality of life for every citizen in the world holds the key to a harmonious and peaceful global society in the new millennium.

Environmental management

Managing the environmental programme in an industrial or commercial facility has become an increasingly complex and challenging assignment owing to the expanding maze of environmental laws and regulations and the growing public expectations regarding environmental protection. The foundation of environmental management is an understanding of the laws and regulations that apply to an industrial facility. Once compliance programmes have been established at a facility, they should be supported by good and accurate environmental record keeping.

However, to meet the demands of the future, simple compliance with the law is not enough and many companies are opting for strategies "beyond compliance." The advent of international programmes

such as EMAS and ISO 14000 have transformed environmental management from a local to a global issue. In the future, the environmental performance of industrial facilities around the world will be compared with the use of the same sets of standards, and the ability of companies to meet these standards may affect the acceptability of their products in the marketplace.

Environmental management programmes combine a set of tools, procedures, training and expertise that can be applied to meet the resources and objectives of specific companies or to "fine tune" existing programmes. They may also prove useful to companies that want to improve their environmental management practices, while establishing an environmental management system structure or instituting an environmental annual reporting programme.

An environmental management system (EMS) is a structured approach to planning and implementing environmental protection measures that enable organisations to measure their environmental performance, and then regularly evaluate their performance and improvement. To develop an EMS, an organisation has to assess its environmental impacts, set targets to reduce these impacts, and plan how to achieve the targets. Given the numerous ways businesses impact the environment – purchasing, manufacturing, resource consumption – improved environmental performance is of the essence.

In order for an environmental management system to be successful, existing management practices must be revised. Some simple, practical, common sense measures of "good housekeeping" can be undertaken by industry to reduce the costs of production, enhance overall productivity, and mitigate environmental impact. These practices relate to a number of measures dealing with preventing the loss of raw materials, minimising waste, conserving water and energy, and improving operational and organisational procedures. The implementation of these practices is relatively easy and the cost is usually low.

G ood environmental management is common sense and often leads to greater economic efficiency. Understanding and resolving the most common environmental management issues affecting the operation of industrial facilities is essential for the successful implementation of any environmental management programme. Once a fundamental understanding of relevant laws and regulations has been achieved, site-specific programmes for each area of environmental regulation can be developed and applied. Originally, environmental measures were designed to reduce "end-of-pipe" emissions and were a large financial burden. Recently, however, a more integrated approach which involves implementing environmental management systems and other environmental management tools has gained wider acceptance in industry.

*Revising management tools and practices*

In the new millennium, corporate environments are changing. Business is becoming more competitive and the challenge is to stay afloat. Every opportunity to raise corporate profits needs to be examined – from instilling operational efficiencies to reducing large-scale capital costs or providing simple solutions to the more complex. One important example of these efficiencies is a waste reduction programme. The implementation of such an undertaking is known to result in increased savings for corporations, all for relatively small investments in time and energy. Even in large, multinational organisations, these types of programmes increase economic efficiency without impacting product quality.

Cleaner production (CP) is the continuous application of an integrated preventative environmental strategy applied to processes, products and services. It embodies the more efficient use of natural resources and thereby minimises waste and pollution, as well as risks to human health and safety. It tackles these problems at their source rather than at the end of the production process; in other words it avoids the "end-of-pipe" approach.

For processes, cleaner production includes conserving raw materials and energy, eliminating the use of toxic raw materials and reducing the quantity and toxicity of all emissions and wastes. For products, it involves reducing the negative effects of the product throughout its life-cycle, from the extraction of the raw materials right through to the product's ultimate disposal. For services, the strategy focuses on incorporating environmental concerns into designing and delivering services.

Experience of applying cleaner production shows that many improvements can be made in the production processes at no or very little cost. This improves both a company's profitability and its environmental performance. Industries, businesses and service providers have started to employ certain tools for cleaner production.

Some of these tools can be adopted and utilised by individual organisations, others function best if applied across a whole industry or by government. Protecting the environment extends beyond the physical boundaries of a particular site. By focusing efforts outwards, resulting product stewardship initiatives prepare a company to meet the needs of the future while increasing marketability in the present.

To decrease the impact a particular product has on the environment, it can be assessed according to life cycle analysis (LCA) procedures, by examining its environmental impact from raw materials and production to use and final disposal. By adopting a life cycle approach, environmental quality can be designed into the product at conception. This uses a cleaner manufacturing process, minimises the product's impact on the environment and can provide savings through re-manufacturing, parts recovery, and recycling.

**Green Salary – new employment opportunities**

With current unemployment rates rising and governments forced to allot significant portions of their budgets for covering unemployment benefits, the time has come to seriously consider viable alternatives to counter the situation. In place of unemployment benefits, B.I.O. has proposed, since 1985, the introduction of a Green Salary for the unemployed in exchange for their involvement in environmental protection projects. Such projects could include tree planting, city cleanup, recycling, resource recovery and other constructive activities. This Green Salary can help elicit a positive feeling among the unemployed, in addition to providing new opportunities for work and aiding the attempt to lower unemployment levels. Moreover, businesses could be granted special tax deductions when providing opportunities for the unemployed to be involved in environmental projects.

**Genetic Banks – saving the wealth of biodiversity**

We live in an age where the state of a nation's wealth is evaluated increasingly upon economic factors such as stockmarket performance and shrinking budget deficits. Booming industrialised economies have budget surpluses running into trillions of dollars, while even in countries with weaker economies millions of working class people are investing in shares in runaway stockmarkets. This unprecedented spurt of misguided economic growth is seriously jeopardising the environment and threatening biodiversity at a phenomenal scale.

The protection of the environment and of the life that prospers within it are low on the list of priorities of near-sighted decision-makers, demonstrating just how crucial it is to adopt a long-term vision in policy. The real wealth of our planet is in the sheer breadth, richness and beauty of the plants and animals whose species are quietly reduced every year by an insatiable hunger to feed material desires that have grown all out of proportion to our needs.

One of the ways propounded by B.I.O. to safeguard this wealth of life on our planet is Genetic Banks, which preserve the genetic material of endangered plant and animal species and thereby protect the enormous wealth and diversity of wildlife. The role of urban green spaces and sound agricultural practices in preserving genetic diversity in flora and fauna is of crucial importance globally.

Urban green spaces and urban gardens are rich reservoirs of wildlife and biodiversity. They frequently bring remnants of old wildlife habitats and are increasingly being acknowledged as a key resource for wildlife and some threatened species which no longer can depend upon their original habitats. As such, urban green spaces provide a great opportunity to protect biological diversity, a real indicator of wealth on our planet. By creating local Genetic Banks in urban gardens, genetic variety in endemic species can be preserved . Moreover, the introduction of nature conservation into the management of urban green spaces can encourage a more diverse landscape and help to stimulate wider interest and knowledge of the natural world.

Environmentally-sound agricultural practices preserve biodiversity in crops and help to protect soils from contamination and erosion. Local Genetic Banks that preserve genetic material from endemic crop species can help restore genetic variation in agricultural crops and result in pest-resistant, high-yield varieties which do not depend on chemical fertilisers.

According to a recent report – published in June 2001 – of the UN Food and Agriculture Organisation's Commission on Genetic Resources for Food and Agriculture, the UN FAO places as a priority the survey and inventory of plant genetic resources for food and agriculture, taking into account the status and degree of variation in existing populations, including those that are of potential use. It additionally places as a priority the collection of plant genetic resources for food and agriculture and relevant associated information on those plant genetic resources that are under threat or are of potential use. Finally, strengthening research which enhances and conserves biological diversity by maximising intra- and inter-specific variation for the benefit of farmers, especially those who generate and use their own varieties and apply environmental principles in maintaining soil fertility and in combating diseases weeds and pests is also a UN FAO key objective. The B.I.O. Genetic Banks project can assist and complement these initiatives, and contribute to agricultural development which is based on sound social, economic and environmental conditions.

**Bio-legislation – defending the rights of future generations**

The central concept of bio-legislation is to link the protection of "bios rights" to the defence of the rights of future generations. The interdependence between human rights and human obligations is vital in this context. Rights correspond to obligations, and, in addition to the existence of "human rights," there exists a series of "human obligations" concerning our common responsibility to preserve the environment and improve quality of life on a global level. The defence of human rights should not be regarded as an issue unrelated to the protection of other forms of life on our planet. Health hazards arising from environmental degradation and pollution, desertification, depletion of natural resources, water scarcity and famine are a threat to the human species. To secure our rights and to prevent disaster we need to urgently take on the responsibility of reversing negative trends and protecting our natural heritage.

Although Principle 10 of the Rio Declaration proclaimed that all people should have "effective access to judicial and administrative proceedings, including redress remedy," there has been a growing recognition that environmental justice cannot be achieved without effective international legislation dedicated to addressing environmental issues. After well-documented environmental disasters, such legislation is not a mere aspiration but indeed a necessity. The integration of the environment into all aspects of global policy and the issue of environmental liability are therefore priorities. Normative regulations must take full account of these issues, both locally and globally. Bio-environmental considerations should become one of the determining, if not decisive, factors of decision-making at every possible level. It must also be realised that environmental protection is the only option for securing development in the future. International environmental legislation can further evolve to include relevant provisions for public education, training and information regarding the interdependence between humanity and the environment.

*International Court of the Environment*

Environmental disasters point to the urgency of speeding up the establishment of an active International Court of the Environment, as already promoted by the International Court of the Environment Foundation and by Members of the Permanent Court of Arbitration and endorsed world-wide. It is essential to have a globally acknowledged council as a means for solving environmental disputes and ensuring global environmental responsibility.

The Biopolitics International Organisation is proud to participate in this initiative and to be actively involved in furthering its implementation. B.I.O. has repeatedly stressed that, rather than functioning as just another punitive institution, the International Court of the Environment should provide guidelines and a vision for the prevention of environmental catastrophes, under the auspices of the Permanent Court of Arbitration (PCA). The implementation of this vision came when the PCA Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment were adopted at the extraordinary meeting of the Administrative Council on June 19, 2001.

World Referendum – a new pathway for democracy

Present breakthroughs in the field of communication technology can provide the opportunity for the public to be actively involved in issues concerning our daily lives and be able to cast a vote, anytime, through computer networks – such as the Internet – and other communication links, which can make immediate feedback possible from any corner of the globe. This can open up new pathways for a "participatory democracy," where opinions will be actively expressed and politicians will no longer be able to evade their responsibilities.

In this context, humanity has the unprecedented opportunity to dynamically voice its concern over environmental deterioration. A World Referendum, where every citizen on the planet would simultaneously cast a vote for the environment, would result in a global mobilisation for the reversal of destructive trends and would guarantee a brighter future.

**Bio-ethics – promoting environmental priorities in every human endeavour**

In view of the urgent need to curb environmental deterioration and to secure the rights of future generations, the promotion of bio-ethics as the foundation for the peaceful and harmonious co-evolution of humanity and the environment is a priority for B.I.O. A human being is closely related to, and dependent on, all life on Earth. How, then, can we reconcile our existence with the rapid deterioration of bios? A true appreciation of human life cannot evolve without a conscious effort to protect the environment and all other living creatures on our planet.

Experts and scholars are trying to devise the correct context for bio-ethics in the 21st century. Public health issues, scientific research appropriateness and human rights are becoming the pivot points of debates and legislative frameworks. The issue of genetic engineering is of crucial importance in this context. Is it opening Pandora's box by leading to unforeseen difficulties, or can it, with the guidance of biocentric principles, become the most significant scientific contribution in the new millennium?

Organised efforts to protect the natural environment are a relatively recent phenomenon. The major portion of human history has been dominated by an "anthropocentric" view of the world, in which the environment is seen as existing for the benefit of human beings only. B.I.O. has been trying since its inception to promote a shift to a "biocentric" viewpoint, by stressing the interdependence of all forms of life. In this effort, consideration should be given to the role the environment can play in determining the future of humanity. Human rights, the biomedical implications arising from the advancement of science, and concerns over pollution and dwindling natural resources cannot be treated in isolation. The environment as a common point of reference can provide a powerful link and lead to the comprehensive treatment of the challenges we face.

In medicine, the Hippocratic Oath has determined, since the 5th century B.C., ethical guidelines and the right vision concerning the behaviour of physicians. Codes of conduct inspired by the Hippocratic Oath also exist in several professions, such as engineering and business. However, these codes of conduct make very little, if any, reference to the environment. To protect the environment and life on our planet, B.I.O. has proposed that guidelines similar to the Hippocratic Oath be developed and implemented in every field of human endeavour. The hope is that humanity will acknowledge the value of environmental ethics and will place respect for the environment at the core of every action and thought.

**Bio-assessment of technology**

Technology expands human potential but can also have disastrous consequences for the state of the environment and life on our planet. Technological development that proceeds without concern for its impact on the environment is not viable. New technologies that prevent pollution, rely on clean energy sources and encourage resource conservation should be further researched and pursued. Moreover, progress in every field of human endeavour should be evaluated in terms of its contribution to environmental appreciation and protection. Policy on industry-related risks, scientific research in and development of clean technologies and nuclear safety and radiation protection, must be implemented globally.

Solutions to environmental problems and the development and implementation of environmentally-sound technologies require a range of different disciplines and skills, and, in particular, imagination and innovation. The "bio-assessment of technology," as promoted by B.I.O. since 1985, involves a thorough re-evaluation of priorities in technology and the development of initiatives that respect and help the environment. These initiatives include environmentally-friendly technology, as well as progress in genetic engineering and biotechnology, which should, however, always be carried out with the aim of protecting every form of life on our planet.

Humanity possesses the option for alternative futures. The rapid rate of technological progress provides an ascending ladder of knowledge and a bridge linking the present and the future. With an improved understanding of life processes, we can be better prepared to reflect on the problems created by modern technology. The bio-assessment of technology can assist humanity in making informed decisions and in appreciating the fragility of life on our planet.

**Bio-health**

Environmental hazards are a serious threat to public health and well-being. Impact is often large-scale and irreversible. Changes in ecosystems as a result of environmental deterioration may affect the growth, transmission and activity of many infectious diseases. Human health is likely to be adversely affected, either directly or indirectly, through complex interactions of biological systems.

A major cause of exposure to substances which are hazardous to health is atmospheric pollution. The most common of the well-known air pollutants –suspended particulate matter and ozone –are associated with ill health even at relatively low concentrations. The effects include short-term impacts on pulmonary function, increased incidence of respiratory symptoms, and increased mortality implying considerable reductions in life expectancy. Air pollution also plays a role in the aggravation, and possibly the causation of asthma and other allergic responses, which are increasingly prevalent diseases, especially in children. Stratospheric ozone depletion causes increased UV radiation and will enhance the instances of skin cancer in the future, despite the reductions in the production of CFCs and other ozone-layer-depleting substances. Increased UV-radiation also reduces the response of the immune system, and causes eye cataracts and other impacts.

Water quality is another significant factor in exposure to health risks, particularly nitrate contamination of groundwater resources. Increasing chemical water pollution from agriculture is a problem in many developed and developing countries. Pesticides and their degradation products are, in some areas, found in drinking water or in groundwater. Moreover, a broad class of chemicals present in the environment, such as PCDDs, PCDFs, PCBs, persistent pesticides, some detergents and some compounds used in the plastic industry, are known to have a capacity to interfere with hormonal regulation mechanisms.

*Nutrition*

The rapidly changing, chemicalised and polluted world of today is resulting in the human body's increasing inability to cope with substances in the environment. In view of growing environmental concerns, nutrition has been challenged in an unprecedented way to reconsider its basic tenets. Environmental medicine, clinical ecology, toxicology, molecular biology, and genetics are all evolving to meet these challenges, providing new insight for understanding nourishment. Irradiation, use of additives and pesticides, packaging, organic farming, sustainable agriculture, deforestation and genetically modified foods are rapidly becoming issues of global importance for public health.

The further we extend nutrition out into the environment, the closer we are going to get to molecular events inside our cells. Nutrition is the governing factor in the microenvironment of the cell. What we eat directly influences the behaviour and metabolism of our cells, which are called upon to use and excrete the substances we provide them with through the foods we consume. The more we think about nourishment as a process directed at the planet as well as the body, the healthier we are all going to be. A healthy environment is a prerequisite for a healthy human population.

**Bio-agriculture – soil management and biotechnology**

The world-wide degradation of farmland has been an escalating crisis for many years. Erosion, acidification, loss of organic materials and minerals, and overuse of chemicals and pesticides are causing great damage, and land is loosing its inherent productivity. Because of poor soil quality, food supply problems continue to affect many developing countries which do not have the soil to uphold agricultural production, so necessary for their current food requirements and economic development. But in developed countries also, ground and water contamination are growing concerns. Overuse and mismanagement of organic wastes such as manures, biosolids, and some industrial wastes have caused great environmental damage to waterways and watersheds through non-point source discharge pollution.

Soil damage and degradation due to irresponsible agricultural management are also a serious threat to public health, therefore viable agricultural practices should be a priority in environmental policy. Since soil pollution depends on complex interactions between soil constituents and pollutants, the evaluation of soil quality is a prerequisite for formulating international policy and legislation to limit contamination and restore quality.

Modern agriculture has had to become more intensive to meet the demands of a steadily growing population. Agricultural chemicals were the basis in order to produce increases in productivity. The synthetic chemical pesticide industry that emerged in the 1950s offered farmers miracle chemical compounds to control pests and enhance yield. Chemical pesticides were cheap, effective in small quantities, easy to apply, and widely toxic. Widespread adoption of chemical pesticides contributed to remarkable increases in crop yields, but also resulted in the poisoning of farmers and rural residents, contamination of food and drinking water, destruction of wildlife habitats and even of the crops these chemicals were supposed to promote . From the long-term perspective, agricultural chemicals have turned out to be less than miraculous.

We must realise that public health, social responsibility, and environmental protection are all seriously endangered with current land application practices. To prevent and remediate soil and groundwater pollution, to ensure the environmentally-friendly use of land and groundwater resources, to improve the living environment, and to enhance public health, governments, municipalities and local communities must co-operate on an international level. Furthermore, the protection of local farming communities, in all regions of the world, is essential for the maintenance of plant genetic diversity and for the prevention of further soil degradation.

*Genetic engineering and food production*

The recent spotlight on genetically modified foods and public attitudes towards them has revealed some fundamental misunderstandings about what genes are and what they do. Genes are units of inheritance composed of DNA. They are found in almost every cell of all plants and animals and are consumed everyday as part of our normal diet. They have no effect on us however, because they are broken down as the food is digested or, if they are contained in resistant structures, like seeds, they pass unchanged through the body and are excreted. There is no reason to believe things are any different for genes in genetically modified foods. Even though certain changes are introduced to the genes, the building blocks of DNA are exactly the same. This does not mean, however, that gene-altered foods are any less risky.

Research suggests that genetic engineering of food could create unexpected new allergens or contaminate products in unanticipated ways, resulting in threats to public health. In addition, bioengineered crops could spark widespread environmental damage by creating pesticide-resistant insects and weeds.

Humans have been genetically manipulating food for centuries. Traditional plant breeding could be called a form of genetic engineering. Farmers routinely select strains of crops for desirable characteristics, such as higher yields, disease resistance, and more pleasing textures or colours. But there is one key difference: In traditional plant breeding, genes are mixed between plants that are closely related, if not virtually identical, from a genetic standpoint. The protests over genetically engineered foods centre instead on the potential hazards of transferring genes between different plant species – or even between animals and plants – and on the fact that this can change the characteristics of crops in unintended and perhaps dangerous ways.

Gene-altered crops may endanger human health. New crops could produce unexpected allergens or chemicals that can interfere with enzymes and hormones in the human body. One of the most disturbing prospects, however, is that engineered proteins from organisms that humans have never consumed might end up on our plates, and that some could trigger heretofore unknown health effects. Tampering with crops can also cause unintended damage to habitats and ecosystems, by destroying beneficial flora, fauna and micro-organisms.

Recombinant DNA technology is an inherently risky method for producing new foods. Its risks are in large part due to the complexity and interdependency of the parts of a living system, including its DNA. Wedging foreign genetic material in an essentially random manner into an organism's genome necessarily causes some degree of disruption, and this disruption could be multifaceted.

The danger lies mostly in how little we know. It is impossible to predict what specific problems could result in the case of any particular genetically engineered organism. Progress cannot be halted but, through the bio-assessment of technology, it can be steered in the right direction. It is therefore imperative that a biocentric ethical framework be set, to guide this promising and helpful technology on a course that will benefit humanity and the environment as a whole.

**Bio-architecture**

Every living organism on Earth represents a perfectly functioning system, well adapted to the environment as a result of the millions of years of evolution. The structures of biological systems – be they beehives, termite nests, the cell membrane or other organelles – are available to humankind. The unravelling of the "microcosmos" and "macrocosmos" can provide new dimensions in architectural models and city planning. We may avail ourselves of nature as both an inspirational model as well as a view of the progress of biomaterials and a means to break away from stagnant patterns and realise the expanded possibilities afforded by technology and biocentric thinking. **The objectives of bio-architecture, as promoted by B.I.O. since its inception in 1985, are to:**

- bring out the importance of biological patterns and bio-materials for architecture on different scales and levels of design
- present new possibilities and new scopes in restructuring urban and agricultural areas, as well as human settlements in general, in accordance with environmentally-sound principles
- introduce the notion of a "biopolis" as an optimal strategy in architecture and urban planning

Cities are themselves environmental habitats. Urban development usually reduces biodiversity by building over land and displacing animal and plant populations. However, it can also create new habitats and niches. The character and structure of urban green spaces, the connections between them, their interactions with buildings, the ways they are managed, levels of noise disturbance and pollution, and patterns of human behaviour, such as recreation, all influence the habitat qualities of cities. To preserve and enhance urban green spaces and to improve the quality of life of citizens, a shift towards more environmentally-oriented priorities is required, and as a consequence, an adaptation to more environmentally compatible lifestyles, both at the management level – urban design and planning, transport, etc. – and at the individual household level through awareness and education.

Many of the world's city problems could be resolved by paying greater attention to the environment. Architecture and urban planning based on environmental preservation are the only option for maintaining quality of life and preventing lasting environmental damage. Pollution reduction, waste minimisation and energy conservation can be furthered through environmentally-friendly urban design and construction. Awareness of these issues and information on possible opportunities existing world-wide are vital to the development of new possibilities and new scopes in restructuring urban and agricultural areas, as well as human settlements in general.

Bio-architecture links the appreciation of the environment and biodiversity with urban design and planning. Bio-architecture also promotes the use of materials and techniques which are environmentally sound, culturally sensitive and reliant on local resources and skills. A "biopolis," as promoted by B.I.O., functions as a model for the harmonious co-evolution of humanity with the bio-environment. It is based on the application of clean energy sources – solar, wind, hydrogen, etc. –

cleaner production and environmentally friendly materials, and aims at creating a self-sufficient, aesthetically pleasing urban environment with minimal waste generation and with an active participation of every member of society in the protection of bios.

*Urban green spaces in city planning and architectural design*

Cities around the world have enjoyed tangible and intangible returns on investments in urban green spaces through increased development, economic viability of neighbourhoods, increased tourism, reduced crime, healthier environments, and a better quality of life. A combination of any of these factors can have a direct impact on property values and on a community's ability to attract small business. Parks and gardens are crucial to the health of urban communities.

Public open green spaces in towns and cities are an essential part of the urban heritage, a strong element in the architectural and aesthetic form of a city, play an important educational role, are environmentally significant, are important for social interaction, foster community development and are supportive of economic objectives and activities. In particular they to help reduce the inherent tension and conflict in deprived parts of urban areas and play an important role in providing for the recreational and leisure needs of a community contributing to environmental enhancement. Green spaces also play a major part in assisting the economic revival of cities, not just through creating jobs but in increasing the attractiveness of a city as a place for business investment and sought-after residential areas. Urban green spaces provide wide-ranging opportunities for outdoor recreation, and make a valuable contribution to the health, prosperity and diversity of places and people, by improving quality of life in a city through a number of different benefits, including:

- increased property values
- increased tourism
- reduced urban noise and stress – trees, parks, and greenbelts along freeways have been demonstrated to exert a powerful calming influence on individuals and on urban stress in general.
- more educational opportunities for area schools
- more walking, biking and other healthy outdoor activities, especially in southern climates where shade is an important consideration when spending time outdoors during the summer months
- improved visual appeal of urban areas and increased civic pride and responsibility
- greater availability of urban habitat and increased biological diversity

**Bio-energy**

The sustainable production and use of energy poses some important challenges to the development of environmental policy world-wide. Among the issues of greatest interest are the increasing role of renewable energy resources, the reduction of energy consumption and greenhouse gas emissions and the changes in the lifestyle necessary to ensure a sustainable use of energy.

Until quite recently, technological progress relied heavily on the extensive exploitation of fossil fuels, such as coal, oil, gas and, in the last decades, uranium. Now, considerable efforts are being made to economise these non-renewable energy resources and to decrease the environmental pollution caused by their consumption. It is one of the basic objectives of B.I.O. to sensitise experts in the field of energy who in turn will look for alternative sources of energy, thereby removing the "dependency" on non-renewable resources in order to achieve a sustainable world economy. In this context, considerable importance has been attached to the research and development of alternative renewable and environmentally-clean energy sources, as well as energy obtained with the use of living organisms and bioenergy.

The break of the third millennium coincided with important challenges for the energy sector at the global level. Environmental concerns are gaining ground mostly on economic considerations, but above all, decision makers are now facing crucial long-term energy policy choices. The on-going liberalisation of the gas and electricity markets is profoundly changing the structure and dynamics of energy markets in Europe. Furthermore, world markets are becoming more fluid, and decisions

affecting one country necessarily affect others. In the years to come, investments in energy, both to replace existing resources and to meet increasing energy requirements, will oblige economies to arbitrate among energy options taking into account environmental concerns. The opportunity should be seized to promote an environmentally-sound energy policy at the global level.

**Bio-tourism**

The environment recognises no boundaries and brings people together in a common cause. With tourism being one of the most rapidly developing industries world-wide, the infinite biodiversity of our planet can be cherished through conscious efforts to turn travel and tourism into initiatives for a global appreciation of bios. Tourism offers a clear example of why the integration of the environment and development makes sense. Cultural diversity, tradition, history and "mythos" can become the cornerstones of a new form of tourism: bio-tourism. Bio-tourism is not just a conventional travel plan. It paves the way for people to explore the world's natural and cultural heritage.

Bio-tourism underpins environmental and cultural appreciation in tourism and furthers activities that promote an international exchange of experiences on the basis of environmental preservation. Through knowledge comes appreciation and through appreciation strong ties and friendship can be established. Bio-tourism operates outside political and national divides. It encourages informed travel choices that respect the environment and support local economies. It is a vehicle for peace based on co-operation and mutual understanding.

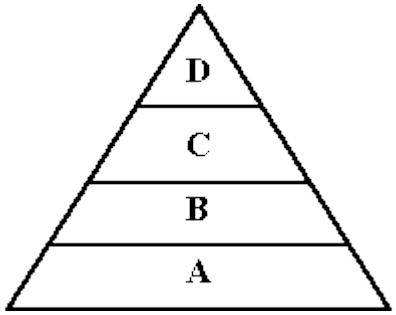
**Environmental Olympics – Bios Prizes – racing to save the environment**

Economic development at the expense of the environment is a disastrous prize. Environmental abuse is a heavy load resting on the shoulders of future generations. But how can we encourage every citizen on the planet to become involved in environmental protection?

The word "athletics" comes from the Greek term "athlos" meaning achievement, both physical and mental. The Olympic Games is a perfect opportunity to turn the world's positively focused attention to the environment. Achievements in environmental protection – in all professions and specialities – can be awarded Bios Prizes so that every individual may participate in the race to save the environment.

In order to promote incentives for environmental protection and a global bio-culture for the new millennium, B.I.O. has been proposing the development of multidisciplinary international committees, assigned with assessing progress and awarding Bios Prizes to individuals, or institutions, that have significantly contributed to the preservation and appreciation of the bio-environment.

Example: Bio-Legislation




A. Global legislative community to nominate candidates

B. Supreme court justices and university law professors to receive nominations and propose up to 150 candidates for award

C. Elected 30 member International Committee to select 15 nominations

D. 3 member International Committee to award 3 Bios Prizes

Presently, international competitions take place in various fields, but represent a fragmented view of human achievement. In order to re-establish the harmony and unity behind all expressions of creativity, an overall recognition and award of achievement in sports, arts, and science may be carried out simultaneously, every four years, on the occasion of the Olympic Games.

For example, legislators could be awarded for developing new legislation regarding bios rights; architects, for having worked in the construction of biopolis models; corporate leaders, for including environmental protection in their business activities. Prizes could be awarded in several disciplines, such as ethics, legislation, economics, business, theology, architecture, diplomacy, or philosophy, with the hope to eventually include all human accomplishments. B.I.O. has already implemented the Bios Prize initiative, and the first prize was awarded to Jacques Cousteau in 1996.

*Cease-fire*

In the quest for new societal values for the millennium, a revival of the ancient Olympic spirit can contribute unity and harmony to the development of every aspect of human endeavour. The Olympic Games, held in Greece for over ten centuries, constituted important political and cultural events, promoting a unifying vision of peace, kinsmanship and reconciliation.

The Olympiads should once again be periods of world peace and occasions for all citizens to celebrate the unifying concepts brought forth by the Olympic spirit. At the same time, the global community can be sensitised to the value of a harmonious co-existence as a vehicle for achieving a better quality of life.

Within the spirit of bio-culture, B.I.O. has been promoting the revival of the ancient ideal of cease fire during the Olympics, a proposal adopted as a UN resolution. The hope is that the environment will act as a unifying force for peace, leading to a new social structure, where respect for the continuation of life on our planet will be at the core of every action and thought.

**A view to the future – bio-peace for the millennium**

Humanity will never again be able to disregard the close relationship between its actions and the bio-environment. Rapidly growing environmental problems have led to the realisation of the need to institute a new type of education to raise environmental consciousness among all members of society and disseminate information about the fragile balances of nature. Protecting and managing the environment rationally is the most consequential task in the new millennium and, as such, offers unprecedented challenges and opportunities for all.

Technology has induced the expansion of every field of human endeavour. Like a new Prometheus, with sensitivity and prophecy, it has provided light and fire and has made possible the advent of a new era. In the drama of history, technology closes the curtains on the scenes of the ancient world and introduces a panoramic view of the progress of knowledge. This knowledge may be viewed as the revelation of the truth and a pathway leading to a better future. Education may act as a catalyst and help resolve national and international problems. A better balance between economy and the environment is a tremendous task, conceptionally as well as practically. Its implementation requires a restructuring of the economy and an enrichment of economic policy with biocentric principles.

We all share the gift of bios, the most precious possession on our planet. Political systems have come and gone, financial regimes have succeeded and failed, but bios, in unlimited varieties and forms, has

existed for millions of years. The environment can be considered the most powerful agent for the attainment of world peace and stability. The pursuit of "bio-peace," through the development of concrete plans for world-wide co-operation on environmental conservation, can alleviate conflict and division and contribute to a new era of international understanding, world security and order. The unifying aspects of bios and the bio-environment hold the key to our future. If we all adopt this principle as our guide, then perhaps global peace will become a reality in the new millennium.

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