R E P O R T

On the ethical issues raised in the management of biological wealth

Rapporteurs: T. Vidalis, A. Hager-Theodorides
In collaboration with: D. Roupakias

The management of biological wealth is among the most critical issues of our times. Extensive and increasingly intensive human intervention in the natural environment to satisfy ever expanding needs, reveal that: a) the future of life in any particular place or country as well as on the planet as a whole is crucially affected by human activity, and, b) there are limits to the tolerance of the natural environment beyond which restoration is very difficult, if not impossible, with all which that implies for our life, and for the survival and that of all living organisms.

The above observations call for an, as far as possible, rational approach to the utilisation of biological resources by any organized society. Every country needs to reflect on the issue and elaborate specific political decisions accordingly: decisions on the exploitation of natural resources (soil, water) and land use, the management of agricultural and live stock production, the conservation of ecosystems, the protection of specific biological species and of biodiversity at large, biotechnological research and the application of its findings.

In the present report, we aim to present the basic parameters of this reflection focusing on the management of biological wealth and trying to identify special priority areas for our country. Naturally, this is meant only as a starting point that needs to be further developed in scope and in depth in future considerations.

FIRST CHAPTER

BIOLOGICAL WEALTH IN OUR COUNTRY AND HUMAN ACTIVITY
HAZARDS

1   Biodiversity and benefits for humanity

A country's biological wealth is synonymous to the biodiversity it comprises as a whole. Although the term biodiversity is widely used and considered as having a commonly accepted content, there are different definitions as to its biological content. The most comprehensive definition is "the variety of life at all levels of biological organization" (Gaston and Spicer, 2004). In particular, biodiversity occurs (I) at the level of genes (genetic diversity which refers to the totality of the genetic characteristics of each species), (II) at the level of organisms (species diversity which refers to the totality of species in an ecosystem or an area), and, (III) at the level of ecosystems (ecological diversity, all the different ecosystems of a given area) (Gaston and Spicer, 2004).

The value currently attributed to biodiversity by the international community is reflected by the Convention on Biological Diversity, which was the product of the 1992 United Nations Conference for the Environment and Development at Rio de Janeiro. In the Convention the following definition is given: "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; [the term biodiversity] includes diversity within species, between species and of ecosystems".

But why has the protection of biodiversity been elevated to the level of a universal human value? In philosophical terms, the contribution of the "environmentalist" movement has, of course, been significant. This movement advocated radical, if controversial, approaches such as, in particular, the recognition of rights to nature similar to the natural human rights (reviewed by: R. F. Nas, 1989), something that is in contrast with the anthropocentricity of most philosophical systems.

Irrespective of differences in philosophical approaches, however, the existence of biodiversity undeniably offers specific benefits to mankind which advocate in favour of its protection, some direct, economic or other, and some indirect and less visible (Wilson, 1988). The former include mainly economic benefits in agriculture, science,

medicine and industry. Indeed, any living organism can potentially be used to improve on existing or discover new crop species, pharmacological substances or new treatments and renewable raw materials for the manufacturing of industrial products respectively (in building, clothing, etc.). The largest the diversity of species, the more chances to discover "exploitable" properties among existing species. These benefits of the existence of high biological diversity to humanity will perhaps become more obvious if we consider that environmental conditions and human habits change overtime. As a result, new needs arise in farming or in health care, for instance, crop species that are productive in new climate conditions or treatments for newly emerging diseases respectively.

Another direct benefit of biodiversity is its aesthetic and emotional value and its positive impact on quality of life.

Finally, biodiversity is sometimes part of national cultural heritage which adds yet another reason for its protection (e.g. historic trees like Plato's olive tree, Pausanias' vine or ecosystems like the national reserve of Olympus, the Delta of Evros, the forest of Dadia, etc.).

An indirect but possibly more important, compared to the above mentioned, benefit of biodiversity is its contribution to the stability of ecosystems which ultimately sustain human life (McCann, 2000). In this case, the importance of each species separately is not obvious since the mechanisms and interactions between species and individuals that lead to the sustainability of an ecosystem are not fully known. But a positive association is believed to exist between the total biodiversity of an ecosystem or an area and their survival, stability and productivity.

Finding evidence supporting this association is a task the scientific community has set upon itself. The scientific quest began as early as in the XIX century and was initially based more on theoretical arguments rather than experimental data. Today, the attempt to prove it in practice is met with difficulties confirming the complexity of relations between various forms of life at all levels of biological organization. Generally, however, it is believed that the reduction of biodiversity leads to the deterioration of ecosystems (Tilman, 2000).

Biodiversity is not limited to wild species of flora and fauna but extends to domesticated species of crop plants or farm animals in the form of varieties or races respectively. In this case, the conservation of local varieties, for example, that may be less productive but also less demanding in inputs (e.g. they are more resistant to

drought and so they yield more in conditions of reduced irrigation or they are refractory to pests and diseases and, therefore, require less chemicals) and that have been replaced by modern varieties can prove invaluable for the identification of genes to manage specific problems now and in the future.

2   The biological wealth of Greece

The area of the Mediterranean, and Greece in particular, are included among the planet's so-called biodiversity "hot spots", that is areas with particularly high density of biological species (Myers *et al.,* 2000). This increased biodiversity can be attributed to the geographical position of Greece, its geological history, the variety of geomorphology and the presence of a wide range of different climate types (from Alpine to subtropical). Due to the same reasons, apart from the diversity of species, there is also great diversity of ecosystems and habitats. As a result Greece ranks second amongst EU member states regarding the diversity of higher plant species. Overall, it is estimated that Greek fauna includes between 30 to 50 thousand species and Greek flora more than 6.300 species and subspecies of higher plants (Legakis *et al.,* 1998). Of the known species, 4% of the higher plants and 22% of the vertebrate animals of Greece are classified as endangered (EKPAA, 2002 and Hellenic Zoological Society, 1992).

3   Human activity threats to biodiversity in Greece

The destruction or disturbance of habitats, of the natural or ecological environment in which species populations or communities of species live, are among the more serious threats to biodiversity in Greece. According to a report by the National Centre for the Environment and Sustainable Development, the areas of economic activity that adversely affect biodiversity in our country directly or indirectly (through the contamination of natural resources) are farming, fishing, mining activities, industry, construction and tourism (EKPAA, 2002).

The destruction of habitats occurs by the increase in the frequency of fires but also by land clearing and changes in land use. Mediterranean forests burn due to natural causes every 30-50 years or at longer intervals. Many of the endemic species are actually adapted to fire in the sense that their seeds need high temperatures to

germinate, e.g. pine trees. Nevertheless, manmade causes increase the frequency and intensity of fires reducing the chances of natural regeneration (Rundel, 1998).

Agriculture is among the human productive activities with the biggest environmental impact in our country. And this, not only as a result of farming practices but mainly due to the large percentage of national territory, approximately 70-80%, dedicated to this activity. The stress on the environment has direct and indirect implications for biodiversity because of the consumption of large quantities of water, the use of chemical substances for fertilizing or pest control resulting in water stress, the mechanization of cultivating methods affecting the quality of the soil. The monoculture of mostly high input, high yield varieties has a direct impact on biodiversity both for wild and domesticated species. The consumption of water by agriculture is a major environmental problem as water reserves are limited and the irrigation systems used among the less efficient in Europe. Newly developed and efficient irrigation systems have not been adequately exploited and this wastefulness of water reserves will create serious problems for future generations.

Mass tourism, mainly directed to coastal zones, entails risks and has caused significant population movements and changes in land use. In particular, tourism leads to increased construction in coastal areas and to the deterioration of aquatic ecosystems. Nevertheless, the movement of human populations and the abandonment of farming and stock-raising activities in favour of tourism has, on some occasions, resulted in an increase of woodland. For example, a study in a limited area of western Crete which included, however, all types of Mediterranean ecosystems showed that between 1945 and 1989 coniferous woodland expanded and replaced other types of vegetation (Papanastasis and Kazaklis, 1998). This finding illustrates the impact of overgrazing on ecosystems but also the potential of reversing the deterioration of an ecosystem when land use changes.

The impact of industry on biodiversity consists in the contamination of natural resources, mainly air and water resources. The problem is accentuated by frequent non-compliance with environmental protection rules.

Finally, a direct threat to biodiversity, in contrast to the above mentioned indirect though significant threats, is hunting and species collection when conducted uncontrollably and without abiding to the relevant regulations (e.g. hunting seasons, number limitations etc.) (Hellenic Zoological Society, 1992).

Some of the organizations that generate knowledge and can contribute more in the future are university departments and faculties of biological, agricultural or environmental orientation, the research institutes of the National Agricultural Research Foundation (N.AG.RE.F.), the Hellenic Centre for Marine Research, the Institute of Marine Biology of Crete, the Benakeion Phytopathological Institute, NGOs like the Hellenic Zoological Society, the Hellenic Ornithological Society, the Goulandris Natural History Museum, WWF, Greenpeace, Arktouros, etc. (Legakis *et al.*, 1998). Apart from generating primary knowledge, however, it is necessary to systematize and use it to elaborate a protection strategy in practice.

Despite the significant biodiversity of our country, or perhaps because of it, there are significant knowledge gaps in the biological (life cycles), ecological (demands of habitats) and population (size and fluctuation) characteristics of fauna and flora species. These knowledge gaps make the protection of biodiversity an arduous task. There is also a lack of systematization of existing knowledge into readily accessible format (data bases) that can be put to good use and could be further expanded.

With the explosion of genetics and biotechnology, field studies of flora and fauna has been sidelined for various reasons. Today, however, it has become apparent that there is not enough field knowledge and a conscious change of direction is needed. This is not so easy because the "naturalists" are threatened by extinction. The funding of relevant actions by the European Union is expected to provide a first incentive to revive ecological field studies.

More than 100 scientists worked together successfully to compile an inventory of the areas of our country that meet the requirements for inclusion in the NATURA 2000 network because of the existence of habitat types and habitats of species that qualify for protection (under the European directive 92/43/EC) and to draw up a national "Scientific List"[1]. Unfortunately, this network of scientists was not put to further use. To comply with the obligations assumed by our country for the protection of biodiversity (by ratifying the Community directive 92/43 on habitats), the National Committee "Nature" was set up in 2003[2]. Its mission is to coordinate protection

---

[1] A table of the NATURA habitats is available at the website of the network of researchers of environmental management: http://natura.minenv.gr/natura/server/user/biotopoi_list.asp?Ing=GR
[2] OJ 1589B΄ (23/12/2002).

activities for conserved areas and could become the coordinator of the national strategy for research in the field. A lack of funds, however, has led the Committee to inactivity. Recently, the General Secretariat for Research and Technology (GSRT) launched a call for tender to award the coordination of research in national biodiversity in the framework of EU action "LIFEWATCH: Science and Technology Infrastructure for Biodiversity Data and Observatories".

SECOND CHAPTER

THE ETHICAL-SOCIAL DIMENSION

In our culture, the management of biological wealth is mainly associated with three factors that set the ethical-social context for the relevant discussion: sustainable development, the value of biodiversity and the "rights of future generations". These considerations can be interconnected in many ways as will be shown below.

1   Sustainable development

The term was coined in the '80s and denotes the use of natural resources in a way that the satisfaction of human needs in the future remains constantly possible. Put in different words, sustainable development meets our present needs without compromising the needs of future generations[3].

Environmental sustainability is considered as part of sustainable development. The economic, socio-political and cultural sustainability (especially in regard to the preservation of native populations) are also crucial aspects to be taken into consideration in an arduous task of balancing conflicting demands and interests.

Environmental sustainability, in particular, is often associated with the term "green development" which assigns priority to the protection of the natural environment. This can potentially come in conflict with the other aspects of sustainability, especially the economic one, for instance, when there is a demand to preserve certain natural species at all costs in countries without sufficient financial resources. Seen in a different light, though, the demand to combine different aspects of biodiversity creates new needs and, with that, new opportunities for unprecedented economic "post-industrial" initiatives with the use of information technologies[4].

Nowadays, the ubiquitous use of the term "sustainable development" and its association by the UN with a plethora of sectors and initiatives explains the criticism

---

[3] The term was established by the report of the World Committee for the Environment and Development (Brundtland Report, 1987).

[4] Such initiatives are in fact promoted by the schools of economics of some universities (e.g. Center for Sustainable Global Enterprise/Cornell Univ. or Erb Institute for Global Sustainable Enterprise/Univ. of Michigan).

that, in actual fact, the term is of little explanatory value, despite efforts to create systems of quantitative measurement of "sustainability" with various indicators.

This problem aside, sustainable development as an ethical-social demand raises questions on many levels.

The first general question is whether it corresponds to some overarching value that would justify such a vast reorientation of socioeconomic activities. The prevailing answer seems to be that such a value may consist in ensuring the survival of the human species in the future, hence some degree of responsibility to future generations. Another answer (given by "environmentalism" or the so-called "deep ecology") proclaims the value of Nature in itself and proposes to abandon the anthropocentricity that has characterized the development of societies so far.

The second question concerns the extent of limitations sustainable development may entail. For instance, is it legitimate to set limits to national sovereignty, especially in developing countries, for the sake of conserving natural wealth (e.g. the big Amazonian forests) or natural resources (e.g. water) which are goods of supranational or universal values? Or is the survival of local populations to be granted absolute priority that would justify the unrestrained consumption of natural resources as was the case in the western developed countries in previous centuries?

And by extension, can we think of some measure of justice in the allocation of duties emanating from sustainable development, even at the level of local, or indeed individual activities? Is thus justifiable that industries may "purchase" pollution ("the polluter pays" principle) or that the intensive exploitation of natural resources by traditional agriculture may go on as it has in the past, and what are the limits in view of the preservation of sustainability?

The third question concerns some form of regulation of the needs of contemporary societies at a global, national or local level. If the current conditions of globalized economy command a more or less free determination of needs, a broad regulation – which might even lead to pre-industrial concepts of life according to some – appears contrary to a fundamental condition of collective and individual freedom. This question can become quite practical: even if sustainable development were to be considered as ethically justifiable, is such a wide project for the economy and for society feasible, and who can ensure its implementation?

Be that as it may, it appears that a system of regulation of needs is no longer only a political demand. The fact that, ultimately, human activity leads to an ever growing

demand for energy at the end of which lies global warming – with the well-known result of the "greenhouse effect" – implies that such regulation is directly imposed as a mere but indispensable condition for the survival of our species outside and beyond all political expediencies.

According to the voice of some sceptic scientists, on the other hand, the term sustainable development is contradictory, as any further development, even at a slower pace compared with the current one, fatally leads to the destruction of the planet due to the inevitable thermal pollution (Kalopissis, 2001). This position, though rejecting any call for development, does not deny the need of regulation for the protection of the environment.

2   *The value of biodiversity*

The perception of biodiversity as a value is the second issue to be considered.

Biodiversity represents a "wealth" of biological resources that we exploit to meet our various needs (food, health, clothing, housing, etc.). It is currently considered as threatened because of environmental pollution, urban expansion, the destruction of the habitats of certain species, and the introduction of alien plant or animal species in particular areas leading to the gradual extinction of local species[5].

It is precisely as a "wealth" of biological resources that biodiversity is seen as worthy of protection other than a mere fact of nature. Our culture values the conservation of current species although we know that in the history of our planet the content of biodiversity has been constantly changing, namely that millions of species have disappeared or appeared – and continue to disappear or appear. This is natural – an inherent characteristic of life and the result of changing environmental conditions – but we are aware that the action of one species in particular – the human species – can become critical (Markl: 38,40). In this sense, the state of biodiversity inevitably depends on our own decisions and activities, economic, political, social, etc., and so the discussion about its value becomes meaningful.

Care to maintain the wealth of biological resources is also part of sustainable development. Certain questions arise in this respect too.

---

[5] The free circulation of genetically modified organisms (e.g. fish) has, in some cases, had the same effect.

Given the other dimensions of sustainable development that may be incompatible with the conservation of certain species for economic (excessive cost for wild animal infrastructure, etc.) or social reasons (the development of third world countries requiring large-scale interventions in the environment, the preservation of traditional professions, etc.), are there limits to the preservation of biodiversity? In the same vein, can we envisage some kind of hierarchy in the value of species, and with which criteria?

Given the rapid development of biotechnology, do we have unlimited freedom in changing the content of biodiversity by introducing new species (even wholly "unpredictable" ones using genetic engineering methods)? Are we allowed to do so even at the risk of extinction of other, naturally occurring species as a result of their contact with the new ones?

These questions can be answered in many ways but it is worth pointing out that the value of biodiversity is seen in relation to our needs. Thus, biodiversity appears to be a rather relative and not an absolute value, as might be argued by those who deny the "anthropocentric" approach and advocate the extension of the notion of moral subjects to beings other than humans.

3   The rights of "future generations"

The third consideration we are concerned with regards the so-called "rights of future generations". The term underlines our responsibility vis-à-vis coming generations and binds us with the powerful notion of "rights". People (or populations) that do not yet exist are thus recognized as "subjects of rights". For this reason, the pertinence of this terminology is highly controversial since future people are considered among other things "remote in time" and "undefined" (Partridge: passim).

Be that as it may, the ethical duty of "solidarity" between generations is not put in question. This duty is broken down into more special "responsibilities" (according to the terminology of the relevant UNESCO declaration) that are not related exclusively to the protection of the environment (e.g. there is a responsibility to maintain freedom of choice for future generations at all levels, to preserve cultural difference and heritage, peace, development and education, to avoid social discrimination). The conservation and perpetuation of the human species, the protection of the diversity of

the human genome, the protection of life on the planet and biodiversity, and the wider protection of the environment are, of course, vital components of this duty.

As stated above, our responsibility to future generations ethically justifies the sustainable development debate. The crucial question related to this issue concerns the source or foundation of this powerful ethical duty.

At first sight, it is an "imperfect duty" (like kindness, philanthropy etc., according to the Kantian distinction). But perhaps this solution falls short of the powerful commitment we appear to accept.

One could also posit a utilitarian foundation according to which our self-restraint for the sake of next generations eventually improves our present state as well, since it leads to a rational and renewable exploitation of (finite) natural resources.

A third alternative would be to further investigate the subject in the field of the theory of "rights" or, at least, "interests" – either finding a way to overcome the afore mentioned difficulties in recognizing as subjects persons who do not yet exist or dilating the reflection on our own rights and interests. In the latter context, we may postulate, for instance, that future generations are our concern to the extent that our own reproduction is our concern and that sustainable development is to the interest of our children, of their own children, and so on and so forth *ad infinitum*, and as such it is an extension of our own individual interest.

Critical in this discussion, at any rate, is to separate ethical from legal rights: the former have a far greater scope even if their practical implementation cannot be ensured just as effectively.

Finally, in terms of religion, the philosophy of monotheistic religions is anthropocentric for man is considered as the apex of Creation and the top of the pyramid of living organisms. This is basically the "creationist" approach which often leads to the view that our species has absolute dominion over nature.

Yet, many theologians construe this dominion also as a responsibility for the wise management and protection of the environment, mainly as a duty to future generations (Zezioulas, 1992). This approach has actually inspired some initiatives for a more active involvement of Christian confessions and churches, as demonstrated, for instance, by the example of the Ecumenical Patriarch.

THIRD CHAPTER

THE LAW

In regard to the above issues, the law attempts to outline a few directions mainly by way of international and national legislation. We will attempt to describe these directions.

1   International law

I. The Convention on Biodiversity (Rio de Janeiro Convention, 1991) and the Protocol on Biosafety (Cartagena Protocol, 2000)

The protection of global biodiversity with specific measures is the object of the Rio Convention, a fundamental instrument for our topic, which was adopted on the initiative of the UN.

The Convention stipulates certain principles regarding the management of biodiversity; in particular, the principle of sustainable development (exemplified in the well-known action program Agenda 21), the precautionary principle and the principle of preservation of national rights on the management of genetic resources. The Convention was ratified both by the EU and our country (Act 2204/1994).

The "precautionary principle", in particular, places a limit to biotechnological research even when the risk against the environment or health remains uncertain. In this sense, this principle is different – more conservative – than the "prevention principle" which would impose limits only against a very high likelihood of risk. The precautionary principle has been broadly established especially in the law governing modern biotechnology.

The scope of the Cartagena Protocol is more limited and concerns the safe traffic and use of genetically modified organisms for the protection of the environment and health. This instrument was ratified by Act 3233/2004.

II. Other Conventions

There are many binding instruments of international law covering specific issues of biodiversity protection. The most important that are relevant to our topic are:

- the Convention on the protection of wetlands of international importance (Ramsar Convention 1971, legislative decree 191/1974) as modified (Paris 1982, Act 1751/1988, Regina, Canada 1987, Act 1950/1991).

- The Convention on the protection of world cultural and natural heritage (Paris Convention 1972, Act 1126/1981).

- The Convention on the protection of plants (Rome Convention 1951, Act 2014/1992).

- The Agreement on Tropical Timber (Geneva Agreement 1983, Act 1761/1988).

- The Convention on trade in endangered species of wild fauna and flora (Washington Convention 1973, Act 2055/1992).

- The Convention on the conservation of European wildlife and natural habitats (Berne Convention 1979, Act 1335/1983).

- The Convention on the conservation of migratory birds of wild fauna (Bonn Convention 1979, Act 2719/1999).

Issues related to the management of biological wealth – such as the protection of natural resources (water), pollution and the use of energy are also covered by special international Conventions.

III. Non-binding instruments

Significant international soft law instruments on our topic are the UN Declaration on the Environment (1972) which recognizes for the first time the duty to future generations, as well as the afore mentioned UNESCO Declaration on the responsibilities to future generations (1997).

2   EU Law

EU law (which applies as domestic law) is also extensive.

The principle of sustainable development is enshrined explicitly in art. 6 of the EC Treaty whereas art. 174 on the environment declares as an objective "the prudent and rational utilisation of natural resources" and refers to the precautionary and the preventive action principles, to the rectification of damage preferably at source and to "the polluter pays" principle.

In addition, there is ample legislation in specific areas for the protection of habitats (Directive 92/43 which provides the grounds for the NATURA 2000 network), species (Directive 79/409/EEC on wild birds) and the production and trade of genetically modified microorganisms and organisms (Regulations 1829, 1830/2003, Directives 98/81, 2001/18).

3   Greek legislation

Following the revision of the Constitution in 2001, art. 24 on the environment expressly stipulates the "principle of sustainability" (sustainable development) which had often been made reference to in the case-law of the Judicial Review Court as had been the principle of prevention from the early 1990s.

Act 1650/1986 on the protection of the environment is the basic text of our national legislation that implements the instructions of our Constitution. Among other objectives the Act stipulates "ensuring the possibility of regeneration of natural resources and the rational utilization of non renewable or rare resources", and "preserving the ecological balance of natural ecosystems and ensuring their regenerative capacity". This includes measures for the protection of domestic flora and fauna and the management of natural resources.

Acts 743/1977 on the marine environment and 998/1979 on the protection of forests also cover issues of management of biological resources.

The major part of relevant Greek legislation, however, transposes international or community law.

Numerous problems arise in the practical implementation of this legislation as demonstrated formally in the case-law of the Environmental Panel (V) of the Judicial Review Court[6] and in related reports of the Ombudsman's Environmental

---

[6] Strictly by way of indication, see JRC 2304/95 (for national parks), 4950-4953/95 (wild flora/fauna), 1184/96 (vulnerable ecosystems), 1821/95, 3067/01, 3135/02, 2601-2603/05 (protection of the *caretta-caretta* turtle) etc.

Department. The Proposals of the present report make specific reference to these problems.

FOURTH CHAPTER

ENVIRONMENT, SOCIETY, GOVERNMENT

1   The social parameter

The relationship between human beings and nature directly affects the planning, social acceptance and efficacy of any policy on the protection of biodiversity and the environment. The place occupied by the environment in the personal scale of values and the minds of individuals determines their attitude in respect to proposed policies. This relationship is not one and the same for everyone but common characteristics can be traced in particular groups which are determined by residence, occupation, environment-related choices in everyday life and the reasons leading to such choices. The place of the environment and biodiversity in the individual's scale of values and the individual's relationship with nature in general is reflected both in professional choices and in everyday life (choice of intensive, integrated or biological agriculture) as well as in the different motives leading to such choices (e.g. the use of more efficient irrigation systems in agriculture may be due to a conscious effort to protect water resources or to apply for subsidies).

According to the Eurobarometer, Greeks are highly concerned with the environment. However, there is great difference between word and practice. The causes that relegate the environment to a lesser position in the minds of citizens in practice have to be investigated and analyzed.

However this may be, at the level of civil society, the activity of Non-Governmental Organizations of environmental denomination in Greece is particularly important for raising awareness among citizens and bringing pressure to bear on governments.

After the devastating fires of 2007 and their tragic toll there is a sharp increase in the number of volunteers and the quality of volunteer activity and activism (as estimated by the WWF). A great number of NGOs are operating in our country[7] which are either wide in scope (e.g. WWF, Greenpeace, etc.) or focus on the protection of specific species or areas (Arktouros, Callisto, etc.).

---

[7] A full list of environmental NGOs is available on the website of the Ministry for the Environment. It was compiled by the National Centre for Social Research (EKKE) in the context of a related study that was funded by the Ministry for the Environment at the following address: http://www.minenv.gr/3/33/332/33201/3320113/g3320113_0.html

2   The attitude of Government

I. National policies on the protection of biodiversity

In our country, environmental policy-making in general is coordinated by the Ministry for the Environment, Land Planning and Public Works (YPEHODE).

The coexistence of the environment and public works under the same roof is a singular case among the countries of the European Union. The governments of all the other member-states have independent ministries for the environment sometimes including departments of rural development, fisheries or public health. This coexistence and the place assigned to the environment as against the other responsibilities of the ministry through time tell a long story about the place of the environment in the hierarchy of governmental priorities as a whole.

Within the YPEHODE, environmental policy is the remit of the General Division of the Environment which is headed by the Vice-Minister for the Environment. Environmental policy-making is assisted by the National Centre for the Environment and Sustainable Development (EKPAA). The Operational Program "Environment" and Sustainable Development (EPPERAA) for 2007-2013 outlines the objectives and the governmental strategy for the environment. These goals include issues of biodiversity protection.

The Ministry for Agricultural Development and Foodstuffs (YAAT) shares in a great deal of the implementation of environmental policy for it is responsible for laying down the rules for agricultural activity and for supervising their implementation.

Perhaps the main vehicle of environmental policy in agricultural production is *Multiple Compliance*[8], a principle that obliges farmers to take specific measures of environmental protection to qualify for subsidies. The YAAT has also issued codes of Good Agricultural Practice[9] which include measures for the protection of the environment and biodiversity and are recommended to all farmers and mandatory for those who receive subsidies from the program of agricultural development.

---

[8] Since 2005 Multiple Compliance is mandatory. Regulation 1782/2003 of the Council and 796/2004 of the European Commission. A guide of implementation for farmers is available in the YAAT and at: http://www.minagric.gr/greek/agr_pol/KAP/CC_Manual_Final.pdf

[9] KYA 12543/568/20-1-20004 (OJ 142/B'/29-1-04). The Codes are available on the webpage of the YAAT: http://www.minagric.gr/greek/EPAA/INDEX%201/INDEX%201.htm

In addition to these mandatory measures, the Ministry promotes agricultural methods that further reduce the environmental impact like integrated management and biological agriculture, which require special environmental impact assessments to qualify as such. The products that meet the requirements of integrated management or biological farming are certified by accredited bodies. AGROCERT, the Organization of Certification and Supervision of Agricultural Products issues specifications and supervises the certification procedure through the accreditation and supervision of certification bodies. The products which meet the requirements of integrated management receive the label AGRO and the products of biological agriculture receive a similar label by accredited certification bodies[10].

II. Participation in supranational and international policy-making

On the whole, our national environmental policy follows mainly the Directives of the EU with no particular innovations or initiatives.

Greece participates in European and other international actions on the protection of biodiversity, *inter alia* the NATURA 2000 network and the United Nations Environmental Program-Mediterranean Action Plan.

   a. Natura 2000 network

Since the beginning of the XX century, Greece has placed certain areas of particular natural beauty or ecological importance under protection (mainly national reserves). The most important and systematic intervention for the preservation of biological wealth in recent years was envisaged by the European Union through the afore mentioned directives on the protection of biodiversity and the creation of the network of protected areas Natura 2000.

Areas of particular "ecological value" have been mapped in the framework of this network, i.e. sites offering suitable environmental conditions for supporting certain species have been delimitated and designated as protected areas. These sites are placed under special status and the activities allowed within are decided based on the

---

[10] Detailed lists of certification bodies and agricultural consultants are available on the website of the OPEGEP: http://www.agrocert.gr

protection of their specific ecological value. The aim of the EU is to stop the reduction of biodiversity in member-states by 2010.

b. Action Plan for the Mediterranean

The conservation of Mediterranean ecosystems is paramount given that the environmental changes caused by human activity in this area are more dramatic than in any other area on the planet (Groves, 1998).

Due to the importance of Mediterranean ecosystems, 16 Mediterranean countries and the European Union adopted the United Nations Environmental Program-Mediterranean Action Plan (UNEP-MAP) in 1975 which was initially aimed at the protection of the Mediterranean Sea from pollution. Today 21 countries and the EU participate in the Action Plan. The activities of the program were extended to the integrated management of problems in coastal development zones with the aim to study problems and assist governments to make environmentally-friendly policies.

FIFTH CHAPTER

CONCLUSIONS-PROPOSALS

1   General environmental policy and protection of biodiversity

I. A Ministry for the Environment

The European Union and the Greek Parliament have recognized the environment as an area of independent policy-making, the former by appointing a Commissioner for the Environment and the latter by setting up a Special Standing Committee for the Protection of the Environment. By contrast, the government has no independent ministry for the environment as mentioned earlier.

The advantage of accommodating the current vice-ministry for the Environment and Land Planning in the YPEHODE is that it belongs to a powerful ministry. The disadvantage is that the sector of public works has always prevailed in practice and continue to override the priorities of the ministry.

According to one argument, a separate ministry for the environment may rank low in government priorities and thus undermine the efficacy of initiatives. This is not a convincing argument for it fails to consider that, already on the symbolic political level, environmental protection now strongly affects the political behaviour of both citizens and politicians themselves. With this in mind, the possibility to take initiatives that will no longer conflict with other interests in the same ministry, and a clearly defined responsibility for the minister inside the cabinet must be evaluated. Taking all that into account, the creation of an independent ministry for the Environment calls for immediate consideration.

II. The environment and the financial crisis

Globally, there is already an attempt to use the current conditions of global recession as a pretext in order to downgrade the questions of environmental protection. Thus, a number of economists and politicians argue that these are really "luxury issues" that should be left aside until recovery.

At the other side of this line of reasoning, the recession can be seen as an opportunity to redefine the notion of "development". That is, to recognize the quality of the environment and, by extension, environmental protection as a non-negotiable value, an indispensable aspect of development.

To achieve this, it will be necessary to turn the spotlights more on questions of environmental policy and related actions in order to upgrade the priority of environmental protection issues at large, and of biodiversity in particular. Critical here is the encouragement by government of business initiatives to take targeted actions to protect the environment.

III. The problem of control

The perception of environmental protection as a "local issue" – and the ensuing delegation of control mainly to local government agencies – does no longer respond to the urgent need to deter large-scale damage which is already occurring with increased frequency in our country as well. Serious mismanagement practices in environmental questions are often seen with the connivance of local authorities. The State must take up the main responsibility of control with its central and decentralised services. In the same vein, the relevant legislation needs to be revised accordingly.

On the other hand, there is the problem of the actual incapacity of Panel V of the Judicial Review Court which rules on environmental matters to carry out technical evaluations of the accuracy of environmental impact assessments submitted by public bodies (especially in regard to public works). These assessments include chapters on the protection of biodiversity but the Court cannot conduct technical verifications and limits itself to reviewing the formality of assessments.

A deeper control could be achieved either with the assistance of "*amici curiae*" (technical advisors to the court with no voting rights from special agencies, environmental NGOs, etc.) or with a permanent experts division on environmental issues.

    2   Particular issues of biodiversity protection

    I. Knowledge of Greek biodiversity

The species of Greek nature are recorded only in a piecemeal and "static" way (e.g. by the N.AG.RE.F., the Goulandris Foundation, the Hellenic Ornithological Society and other environmental NGOs). The YPEHODE has funded related research but big gaps remain (especially as regards marine biodiversity). A detailed inventory of species and the systematic monitoring of changes in habitats, populations, etc., are indispensable to the protection of biodiversity.

Therefore, a specially designated body must take charge of the coordination of the recording and monitoring of domestic species (an appropriate candidate would be, for instance, the Greek Centre of Biotopes/Wetlands) in cooperation with academic bodies and environmental organisations.

II. Protected areas (especially Natura areas)

These areas host a high density of biodiversity (flora and fauna). Two types of problems are identified:

a) Normative gaps

- There is a lack of clear demarcation of several such areas.
- The inventory of sensitive marine ecosystems is largely deficient.
- In many areas the allowed activities have not been defined which results in the prevalence of totally arbitrary interventions.

b) Problems of effective control

These areas are not guarded effectively by the responsible authorities (police, forestry authorities, rangers, port police, etc.) especially regarding the prevention of disasters but the main problem consists in a lack of clearly defined control duties for management authorities. The pilot operation of a public prosecutor (at the Court of First Instance of Piraeus) especially dedicated to environmental issues is a case worth mentioning.

Management authorities need to be granted a specific enforcement mandate either independently or in cooperation with prosecuting authorities (including the right to

issue orders to the latter). The office of public prosecutor for the environment should be extended to general application.

III. Impact of Farming and Stock-raising on biodiversity

a) Problems from farming practices

Agricultural activity, mainly due to its territorial intensity, has a major impact on biodiversity that is often negative because of intensive farming, particularly when tha guidelines for good faming practices are not followed.

A stricter control of farming practices and compliance with safety rules is required of the authorities of the Ministry for Agricultural Development. In addition, the Ministry for Agricultural Development must provide incentives to adopt practices that reduce the indirect and direct negative impact on biodiversity[11]. Institutions such as integrated management through the certification of farming products and practices with the label AGRO or the promotion of biological crops and related products are steps in the right direction.

b) Protection of agricultural biodiversity

Another way to limit the negative environmental impact, especially from intensive monocultures, is by using local varieties and races. There is already a public bank for the conservation of local varieties at the ETHIAGE of Thessaloniki as well as NGO banks (Aegean Seeds Bank at the Institute "Archipelago", the Network on Biodiversity and Ecology in Agriculture at "Aegilopas" and the NGO "Peliti'). Moreover, there are local citizens associations on the exchange of seeds, the cultivation and trade of local varieties.

---

[11] Deviations from good farming practices and legislation are reflected on the complaints of citizens that reach the Ombudsman at the Department Quality of Life. Among the complaints, of particular interest is the case of aerial spraying in Corfu against the olive fly. This treatment is forbidden by national and community legislation and decisions of the Judicial Review Court. Aerial spraying on the island of Corfu was permitted exceptionally with a special ministerial decision for the years 1999-2002 but the JRC ruled that this was a breach of law and led to serious mismanagement (references in JRC decisions 11327/08.11.99 and 16517/06.11.00).

Agricultural biodiversity needs to be protected by supporting the effort to identify and preserve local varieties and by providing incentives for their cultivation in appropriate environments. The use of existing informal networks of propagation and trade of local varieties and races should also be promoted.

IV. Problems of land use

A most serious problem for the protection of biodiversity consists in land use changing from forest/pasture to farmland and from agricultural to urban. Whereas land uses are fixed, the conversion of determinate plots is a relatively easy procedure resulting in small or large scale changes without a strategic plan.

A central, detailed and stable plan of land use is needed according to well-defined criteria and effective protection from arbitrary interventions[12]. The protection of biodiversity, and of the environment in general, should be on an equal footing with social and economic factors which are taken into account when changing land use. This can be ensured only by a National Land Use Plan for the totality of the national territory.

V. Public awareness

A mere information campaign in schools on the need to protect the environment and biodiversity is not effective because it fails to "mobilise" audiences.

In cooperation with the Ministry for Education the YPEHODE should encourage voluntary programs on specific projects that promote knowledge and protection of nature. Appropriate organizers of such initiatives are environmental NGOs because they rely on voluntarism themselves.

---

[12] Flexibility in the designation of land uses often leads to the destruction of habitats or wetlands especially if no special protection status applies. Typical is the case considered by the JRC on an action to protect a habitat in the Porto settlement on the island of Tinos. In this area, the boundaries of the settlement were not clearly defined and the habitat was not delineated. As a result there was unauthorized building despite decisions by the JRC ordering the dismantling of constructions. Today the area is so much altered by intensive construction that it is difficult to recognize the properties which called for its conservation (Affaire 20671/27.11.2003 JRC).

Acknowledgments

LITERATURE

I. Th. Kalopistis, 2001, *Where are we headed for? The fatal course for humanity and life set by the action of the exponential function of time*, Eds. Papazissis, ISBN 960-02-1476-X

I. K. Karakostas, 2000, *Environment and Law*, Eds. Ant. N. Sakkoulas

EKPAA, 2002, *The Greek Strategy to Sustainable Development: Introduction*, Athens

Hellenic Zoological Society, 1992, *The Red Book of Endangered Vertebrates of Greece*

I. D. Zezioulas, Metropolitan of Pergamos, 1992, *The creation as Eucharist: a theological approach to the problem of Ecology*, series "Orthodox Testimonial", no 44, Eds. Akritas, ISBN: 960-7006-98-4

R. F. Nas, 1995, *The Rights of Nature: a history of environmental ethics*, Eds. Thymeli, Athens, ISBN 960-7369-03-3

G. P. Siouti, 2003, *Manual of Environmental Law*, Eds. Ant. N. Sakkoulas

C. Chong, 2006, *Restoring the Rights of Future Generations*, Int. J. Green Economics 1, σ. 103 επ.

R. M. Cowling, P.W. Rundel, B.B. Lamont, M.K. Arroyo and M. Adrianoutsou, 1996, *Plant diversity in Mediterranean-climate regions, Trends in Ecology and Evolution*, Vol 11(9): 362-366

K.J. Gaston & J.I. Spicer, 2004, *"Biodiversity: an introduction",* Blackwell Publishing. 2nd Ed., ISBN 1-4051-1857-1

R.H. Groves, 1998, chapter 3, collective edition, *«Landscape Disturbance and Biodiversity in Mediterranean-Type Ecosystems»,* Eds P.W. Rundel, G Montenegro and F.M. Jaksic, Ecological Studies, Vol 136, Springer-Verlag Berlin Heidelberg

Legakis A and Spyropoulou S, 1998, *First National Report on the Convention on Biological Diversity*, YPEHODE, http://www.cbd.int/doc/world/gr/gr-nr-01-en.pdf

H. Markl, 2005, *The place of man in Nature: Evolutionary past and genomic future*, in: H. Stefansson (editing), *The future of biosciences*, European Molecular Biology Laboratory (EMBL), Greek Eds. of the University of Crete, pp. 33 sqq.

McCann KS, 2000, *The diversity-stability debate*, Nature, 405, 228-233 31 32

Myers N, Mittermeier RA, Mittermeier CG, da Fonseca GA, and Kent J, 2000 *Biodiversity hotspots for conservation priorities*, Nature, 403, 853-858

V.P. Papanastasis and A. Kazaklis, 1998, *Land Use Changes and Conflicts in the Mediterranean-Type Ecosystems of Western Crete*, chapter 8, collective edition *Landscape Disturbance and Biodiversity in Mediterranean-Type Ecosystems*. Eds. P.W. Rundel, G Montenegro and F.M. Jaksic, Ecological Studies, Vol 136, Springer-Verlag Berlin Heidelberg

E. Partridge, 1990, *On the Rights of Future Generations*, Environmental Ethics and Public Policy www.igc.org/gadfly

R. S. Pathak, 1992, *The human rights system as a conceptual framework for environmental law*, in: E. Brown Weiss (ed.), *Environmental change and international law: New challenges and dimensions*, U.N. University Press, Tokyo

P.W. Rundel, 1998, *Landscape Disturbance and Biodiversity in Mediterranean-Type Ecosystems: An Overview*, chapter 1, collective edition *Landscape Disturbance and Biodiversity in Mediterranean-Type Ecosystems*. Eds P.W. Rundel, G Montenegro and F.M. Jaksic, Ecological Studies, Vol 136, Springer-Verlag Berlin Heidelberg

Tilman D, 2000, *Causes, consequences and ethics of biodiversity*, Nature, 405, 208-211

E.O Wilson, 1988, *Biodiversity*, National Academy Press, ISBN 0-309-01988