MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Italian National Biodiversity Strategy

Full text available in Italian on the website www.minambiente.it

2010 International Year of Biodiversity

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Introduction

The development of a National Strategy for Biodiversity is part of the commitment undertaken by Italy after the ratification of the Convention on Biological Diversity (CBD, Rio de Janeiro, 1992) by means of Law No. 124 of February 14, 1994.

The Convention has the following three main objectives:

- the conservation of biological diversity, at the levels of genes and species as well as communities and ecosystems;
- the long-term or sustainable use of its components;
- the fair and equitable sharing of the benefits arising out of the utilization of genetic resources and by appropriate transfer of relevant technologies.
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Article 6 of the CBD states that each Contracting Party shall, in accordance with its particular conditions and capabilities, develop national strategies, plans or programs for the conservation and sustainable use of biological diversity. Each Contracting Party shall also integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral plans, programs and policies.

To better understand Italy's policies on biodiversity conservation in the last decade, it is appropriate and important to take into account the process which led to the Communication from the European Commission: "Halting the loss of biodiversity by 2010 and beyond. Sustaining ecosystem services for human well–being", COM (2006) 216, while retracing some milestones of EU environmental policy.

The 2001 Gothenburg European Council stressed the need to take concrete action to halt biodiversity loss by 2010. This commitment was subsequently shared and reinforced by the World Summit on Sustainable Development (Johannesburg, 2002) through the adoption of an action Plan aimed at significantly reducing the loss of biodiversity by 2010 (Objective 2010).

In May 2004, participants of the EU Stakeholder Conference "Biodiversity and the EU - Sustaining Life, Sustaining Livelihoods" drafted and approved the Message from Malahide; during the Conference, the International Union for the Conservation of Nature (IUCN) launched Countdown 2010, an initiative aimed at raising the awareness of local governments and civil society about the need to achieve Objective 2010.

Through COM (2006) 216, in response to the Message from Malahide, the European Commission has considered all relevant biodiversity issues thoroughly, by evaluating the soundness of the solutions proposed so far and creating the EU Action Plan "To 2010 and beyond". These documents highlight the need for an intersectoral biodiversity policy, based on the awareness of goods and services that biodiversity provides for human welfare and life's surviv-

al on the Planet. The European Action Plan has guided the activities of all EU countries in recent years.

The actual results achieved in relation to the European objective of halting the loss of biodiversity by 2010 have shown that much remains to be done despite all the efforts and the successes achieved in several areas; in particular, the work done in recent years has demonstrated that the main challenge remains to effectively integrate the conservation and sustainable use of biodiversity into sectoral policies.

In April 2009, the G8 Environment Ministers met in Syracuse, Italy, and held a session dedicated to the theme of Biodiversity after 2010. During the session, the Ministers approved the "Carta di Siracusa on Biodiversity", a document that is entirely focused on biodiversity conservation in future national policies. On this occasion, Italy has become the promoter of a biodiversity vision that will be consciously included in future decisions and activities carried out by the Governments.

The 21 Ministers who participated at the 2009 G8 Environment meeting agreed that:

«[…] biodiversity loss and the consequent reduction and damaging of ecosystem services affect food security and water availability and reduce the capacity of biodiversity to mitigate and adapt to climate change, as well as undermining global economic processes».

«As significant economic loss arises due to the unsustainable use of biodiversity, timely and proper programs and actions, aimed at strengthening the resilience of ecosystems, must be taken».

«A thorough communication strategy, fully engaging all the different sectors, as well as stakeholders, indigenous and local communities and the private sector, to emphasize their own participation and their responsibilities, is also a key factor for the effective implementation of the post-2010 biodiversity framework».

«The reform of environmental governance, at all levels, is essential to integrate biodiversity and ecosystem services into all policies, to turn the current weaknesses in economic systems into opportunities and to boost sustainable development and employment […]».

The Communication from the Commission to the European Parliament COM (2010) 4 final dated January 19, 2010 has highlighted the five main shortcomings in the implementation of COM (2006) 216, attributable, to a varying extent, to the different Member States, which caused the failure of Objective 2010:

- shortcomings in the implementation of Natura 2000 network: the sites of Natura 2000 network (Sites of Community Interest (SCIs) and Special Protection Areas (SPAs)) cover 17% of the EU's territory (and up to 19% of the Italian territory). There have been delays and problems with implementation, especially insufficient human and financial resources allocated to this effort;

- political and strategic shortcomings: in particular, the policies on soils and invasive species require further development. So far, at EU level, related requirements of cross-compliance have been established under the Common Agricultural Policy (CAP);
- data and knowledge gaps: despite the significant progress made, several gaps remain at all levels in biodiversity knowledge, information gathering and data as well as in the main threat factors;
- shortcomings in the integration of biodiversity concerns into the various relevant economic sectors: many initiatives designed to solve problems in the economic and social sectors by Member States, especially by the respective administrative territorial units, such as the Regions in Italy's case, have proved incompatible with the objectives of biodiversity conservation and have often had perverse and negative side effects.
- lack of funding: the financial resources allocated by the European Union and the various Member States for biodiversity conservation have proved insufficient to meet the challenges of Objective 2010.

The Communication identifies four levels of ambition for a 2020 headline target:

- Option 1: significantly reduce the rate of loss of biodiversity and ecosystem services in the EU by 2020.
- Option 2: halt the loss of biodiversity and ecosystem services in the EU by 2020.
- Option 3: halt the loss of biodiversity and ecosystem services in the EU by 2020 and restore them insofar as possible.
- Option 4: halt the loss of biodiversity and ecosystem services in the EU by 2020 and restore them insofar as possible, and step up the EU's contribution to averting global biodiversity loss.
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The European Union has adopted the fourth option for the post-2010 target, the most challenging and ambitious one, by way of the Council Resolution of 15 March.

The new strategic objective for 2020 will take into account the role of the ecosystems and the related services, not just on the European continent but also globally, on the entire planet. For this reason, it is desirable that discussions held by the various Member States of the European Union to define the new post-2010 Strategy lead to the conscious sharing of the need to support Europe's responsibilities in halting global biodiversity loss.

The United Nations declared 2010 to be the "International Year of Biodiversity" to draw the world's attention to the planet's environmental impoverishment following the destruction of habitats, ecosystems and species and the inevitable consequences on human well-being.

The year 2010 therefore marked a particularly important moment for Italy in the definition of the National Strategy for Biodiversity, whose aim is to integrate the needs of biodiversi-

ty with the development and implementation of national sectoral policies and to draw up a vision of biodiversity conservation in the coming decade.

The experience gained on biodiversity at a regional and national level, based on sound scientific information, has unequivocally proved that factors affecting ecosystems are such that an approach to biodiversity, from a conservation perspective, is insufficient (4th National Report to the Convention on Biological Diversity, Final evaluation report of the Community Action Plan). Social, cultural and economic factors must be taken into account in the analytical process: an integrated analysis of the need for conservation and development is the key element of a new sustainability approach where biological, economic and cultural diversity play a critical and synergistic role in the balanced development of the country.

The Strategy can only be implemented through adequate regulatory support, by working on the existing laws and eventually issuing a specific "national policy framework for the preservation and enhancement of biodiversity". This policy should lay down the main principles and guidelines for regional laws impacting on biodiversity. In this context, the existing laws on the subject should be adapted with special reference to protected areas, the Natura 2000 network and other ecological networks while identifying appropriate financial resources.

Title V of the Italian Constitution assigned the exclusive legislative power to the State in the field of "Protection of the environment and ecosystems" (Article 117, paragraph II, letter s of the Constitution) while it transferred specific management competence in various sectors to the Regions and other Local Bodies. Thus, it is obvious that in our Country the main principles of the CBD, in particular Article 6, can be properly implemented only through loyal cooperation between the State, the Regions and the Autonomous Provinces of Trento and Bolzano in relation to the specific powers conferred on them in the various areas, and through the planning and management of activities dealing with key sectors affecting nature conservation.

In this regard, it would be helpful to establish a National Observatory and an Observer Network and/or Regional Offices for biodiversity to promote the necessary coordination of conservation and monitoring activities of biodiversity elements and ecosystem services, also in connection with the National Biodiversity Network (NBN pages 152-153).

Specific National and Regional Action Plans may be the right tools for implementing the National Strategy by facilitating the integration of development objectives with biodiversity conservation goals. Since biodiversity management cannot be limited to regional borders, the consistency of the individual Action Plans of the Regions and Autonomous Provinces must be verified, in compliance with national guidelines, if any.

Moreover, in order to effectively implement the National Strategy and the Regional Biodiversity Action Plans, the appropriate financial resources must be allocated at a central and regional level.

The Strategy's Path

Since the end of 2009, the MATTM – Ministero dell'Ambiente e della Tutela del Territorio e del Mare (Ministry for the Environment, Land and Sea Protection) has begun the participation and sharing process of the draft Strategy, first with the other Ministries, the Regions and the Autonomous Provinces and then with other players, stakeholders and the civil society.

In order to promote an extensive consultation with the various institutional, social and economic stakeholders, the MATTM organized, with the support of WWF Italy and Rome University "La Sapienza", three territorial Workshops (Florence - April 29, Padua - May 6, Naples - May 13) and one dedicated to the Protected Areas (Sabaudia, the Circeo National Park, May 11) with the support of Federparchi to discuss the draft Strategy and collect assessments and contributions in an effort to share their vision and better define strategic objectives, specific goals and priority actions for each one of the work areas.

The workshops, which involved over 500 participants, representing public authorities, industry, trade associations, environmental groups, the three main national trade unions, members of the academic world, scientists and citizens have allowed the collection of a large amount of contributions, which were taken into account when drawing up this draft Strategy.

The initial phase of the process reached its climax during the National Conference on Biodiversity (Rome University "La Sapienza", May 20 – 22, 2010) which was organized around two plenary sessions, three discussion groups "Ecosystem Services and Prevention of Environmental Risks", "Climate Change Adaptation and Mitigation", "Biodiversity, Green Economy and Technological Innovation" and two round tables on "Biodiversity and Scientific Research" and "Biodiversity, Green Economy and Innovation".

On the occasion of the International Day for Biological Diversity, held on May 22, 2010, Minister Stefania Prestigiacomo, in the presence of Italian President Giorgio Napolitano and Cabinet Undersecretary Gianni Letta, opened the closing ceremony of the Conference which was attended by several personalities from the academic world and the institutions.

The outcome of the Conference and the contributions received during the entire participation and sharing process have led to the drafting of this new version of the National Strategy which, in addition to including two new Work Areas, has better defined the Vision, the focalization of priorities and the modalities for implementation and monitoring.

The new document was the starting point for institutional discussions at the "Conferenza Stato-Regioni" ("State-Region Conference") during which the final document was approved.

Thanks to the fruitful cooperation of all those who were involved in the preparation of the National Strategy for Biodiversity, Italy has achieved the goal to have a national instrument by 2010 that will effectively meet the commitment to conservation and sustainable use of the post-2010 Biodiversity, taken on in the EU and in international venues.

The Implementation of the Strategy

The preparation, implementation and updating of the National Strategy for Biodiversity require a multidisciplinary approach and strong sharing and cooperation between policy makers and the central government and regional bodies, with the support of members of the academic and scientific world, while collecting stakeholder requests, so as to promote social, cultural and economic development, and achieving at the same time the objectives of biodiversity conservation.

For this reason, the "State-Region Conference" has been identified as the forum for political discussion and decision making on the Strategy and a special Joint Committee has been created within the MATTM to support the "State-Region Conference", consisting of representatives of the Central government, the Regions and the Autonomous Provinces. A select Committee will be appointed within the Joint Committee to ensure maximum operational effectiveness in the implementation and review of the Strategy.

A National Observatory for Biodiversity will also be set up to support the Joint Committee which will provide the necessary multidisciplinary scientific contribution. The National Observatory will be chaired by the MATTM and will include representatives of the Observatories or Regional offices for biodiversity, major science associations, the academic world and ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale (National Institute for Environmental Protection and Research).

The Observatory will be responsible for developing technical preliminary documents, identifying performance indicators for Strategy monitoring, preparing periodic reports on the results achieved against the set targets, proposing updates and additions to the Strategy in line with the needs and problems that arise at a national level and with the forecasts and commitments made at EU and international level, such as defining the new post-2010 objectives identified by the Conference of the Parties (COP 10) and the CBD and the 2015 deadline of the Millennium Development Goals.

Moreover, to allow stakeholders to remain fully involved in the Strategy's implementation and review, a Consultation Table will be set up involving the Joint Committee and representatives of the main categories of economic and industrial associations, environmental groups and stakeholders.

The establishment of the Joint Committee, the National Observatory for Biodiversity and the Consultation Table will occur pursuant to the Decreto Ministeriale – DM (Ministerial Decree) issued by the MATTM in consultation with the "State-Region Conference".

Duration, monitoring and evaluation of the Strategy Implementation

The Strategy will be implemented from 2011 to 2020.

A report on the implementation of the strategy will be issued every two years; it will deal with the progress made towards the achievement of strategic objectives and other specific goals in the individual work areas and will be approved by the Joint Committee.

In 2015, there will be a shared, in-depth assessment of the validity of the Strategy approach and any need for adjustment.

Evaluation Indicators

Evaluation indicators used for monitoring Strategy results in the achievement of the vision and strategic objectives (outcome and impact indicators) should be distinguished from those used for monitoring the progress made in the achievement of biodiversity conservation objectives (species, habitat and landscape), through priority measures identified in the work areas (status indicators).

In both cases, effective indicators must be identified that take into account the latest developments on this issue within the EU and internationally, particularly with regard to the indicators provided by the EU.

The effectiveness of the indicators selected must be evaluated as a whole. Taking into account the specific information requirements of each situation and the need for an easy application system, the indicators (or groups of indicators) must:

- have ecological significance;
- be sensitive;
- have wide applicability;
- be relatively simple and inexpensive detection indicators.

The system of indicators must make specific reference to the complexity and organization of the Italian land and, consequently, to the problems in the management of floristic, vegetation, forest, faunistic and hydrobiological features, in addition to ecological disturbance leading to environmental degradation.

Critical thresholds must be detected using indicators that are more sensitive to changes resulting from management choices, based on the pragmatic principle that "you can only manage what you can measure". The formulation of critical thresholds is more direct for quantitative indicators whose thresholds can be defined on the basis of precautionary criteria.

The proper application of indicators should include the following actions:

- preparing and publishing regular reports on key environmental indicators;
- submitting regular reports on environmental indicators;
- developing indicators measuring the costs related to the different types of environmental damage;
- creating assessment databases on the subject;
- establishing a wide-ranging review of indicator systems.

To that end, indicators for specific objectives of each work area of the Strategy must be identified.

With regard to the indicators for monitoring the conservation status of biodiversity components, reference should be made to the concept of favorable conservation status of habitat/species pursuant to the Habitats Directive.

In order to evaluate the efficiency and effectiveness of the National Strategy for Biodiversity, a regular monitoring system should be set up, based on outcome and impact indicators, allowing the effectiveness of the policies adopted and the achievement of specific objectives to be evaluated through priority measures for the attainment of the vision and strategic objectives.

Funding mechanisms for the implementation of the Strategy

Since no specific financial instruments for biodiversity exist to date to implement the Strategy, the governance used for various sectoral policies will have to be strengthened, particularly by improving coordination and complementarity between financial instruments at a national and regional level, taking into account biodiversity and environmental costs in the allocation of funds.

Partnerships will also have to be established between the public financial sector and the private sector, thereby improving awareness and participation of the economic players involved.

This process should be followed up by a thorough check on the effectiveness of existing financial instruments in order to optimize resources and properly address future programs.

To that end, the Strategy can serve as a unitary reference framework to coordinate ordinary and additional financial resources and address priority measures.

Annex I provides a brief analysis of the current financial instruments.

Based on the above, the Joint Committee will have to take action in the appropriate venues to increase the financial resources that are needed to implement the Strategy. This activity should primarily focus on the following aspects:

- in a way to ensure that a specific Axis is established in the future direction of the EU regarding the Rural Development Program providing exclusive support to Natura Network; the Axis should include specific measures not only to assist farm-

ers but also territorial efforts to support the conservation and restoration of degraded ecosystems;

- envisaging the development of "payments for ecosystem services" (PES), through regulatory and implementing arrangements, calling for a reform of the current financial instruments and the possible creation of new ones, so that the main ecosystem services provided by biodiversity can be accounted for through a tariff system, thereby providing specific investments aimed at maintaining the efficiency of resources that in this way can be reproduced;
- promoting the creation of a "National Foundation for Biodiversity" that can also collect donations to co-finance the drafting and implementation of Action Plans for Biodiversity as a matter of priority.

The Strategy Framework

Vision and Key Issues

While confirming the national commitment to achieving the objective of halting biodiversity loss by 2020, this Strategy serves as a tool to facilitate the integration of conservation and sustainable use of biodiversity into national policies, due to its intrinsic and tangible value and the importance of ecosystem services resulting therefrom which are essential for human well-being.

Hence, the vision for the biodiversity conservation of this Strategy is as follows:

Vision

Biodiversity and ecosystem services – our natural capital – are preserved, valued and, insofar as possible, restored for their intrinsic value so that they can continue to support economic prosperity and human well-being despite the profound changes that are taking place globally and locally.

With regard to its achievement, the national Strategy is structured around three key issues, which are illustrated in Annex I:

- Biodiversity and ecosystem services,
- Biodiversity climate change,
- Biodiversity and economic policies.

Strategic Objectives

With regard to the three key issues, the identification of the three strategic objectives, that complement each other, is the result of a careful scientific and technical assessment that views the preservation and restoration of ecosystem services and their essential relationship with human life as the prime consideration in the implementation of biodiversity conservation.

The strategic objectives are aimed at ensuring the durability of ecosystem services that are necessary to life, addressing the environmental and economic changes that are taking place, and optimizing synergy between sectoral policies and environmental protection.

Strategic Objective 1

By 2020, ensure the conservation of biodiversity, or the variety of living organisms, their genetic diversity and the ecological complexes of which they are part, and ensure the protection and restoration of ecosystem services in order to guarantee their key role for life on Earth and human well-being.

Strategic Objective 2

By 2020, substantially reduce the nationwide impact of climate change on biodiversity, by defining the appropriate measures to adapt to climate changes and mitigate their effects and increasing the resilience of natural and semi-natural ecosystems and habitats.

Strategic Objective 3

By 2020, integrate biodiversity conservation into economic and sectoral policies, also as potential for new employment opportunities and social development, while improving the understanding of the benefits from ecosystem services derived from biodiversity and the awareness of the costs of losing them.

Work areas

Due to the transversal theme of biodiversity which is closely connected to most sectoral policies, the achievement of strategic objectives is addressed in the following work areas:

1. ***Species, habitats, landscape;***
2. ***Protected areas;***
3. ***Genetic resources;***
4. ***Agriculture;***
5. ***Forests;***
6. ***Inland waters;***
7. ***Marine environment;***
8. ***Infrastructures and transportation;***
9. ***Urban areas;***
10. ***Health;***
11. ***Energy;***
12. ***Tourism;***
13. ***Research and innovation;***
14. ***Education, information, communication and participation;***
15. ***Italy and global biodiversity.***

The analysis conducted in each work area is aimed at maximizing the contribution that can result from each sectoral policy for the achievement of the three strategic objectives and, more in general, of the vision of the Strategy through increased awareness of the importance of biodiversity and ecosystem services, for climate change adaptation and mitigation, and for the economy, firstly, by promoting the application of the existing instruments (legislative, regulatory, financial and voluntary), and only secondly of the instruments developed ex novo.

Each work area is structured based on the following actions:

- identifying the main threats to biodiversity and/or critical areas that have arisen within the same work area;
- identifying specific objectives to counter the threats;
- setting priorities for action based on the planned measures.

For each work area, the planned measures are reviewed starting from the ones at an international level and ending with those at a national level.

Work areas

1. Species, habitats and landscape

Species and habitats

Studies conducted on our fauna and flora to date highlight Italy's great responsibility at European level; with about 58,000 species (only about 2% of which belongs to the Vertebrates), our Country has the highest number of animal species in Europe, with a high incidence of endemic species (nearly 30%).

Even with regard to vascular flora, with 6,711 species, 15.26% of which are endemic, Italy is the European country with the greatest floristic diversity, in addition to bryophytes (1130 species out of 1690 reported in Europe), fungi that comprise over 20,000 species, lichens that account for 2,323 taxa and which place Italy among the richest European countries in terms of diversity of lichens and freshwater and marine algae. The list of species of the marine macrofitobenthos (algae and vascular plants) amounts to 924 accepted taxa.

The outlook in terms of threats to animal species within the national territory has been illustrated by a number of different authors in specific "Red Lists", only with regard to Vertebrate Species. In evaluating the different levels of threat, the authors make reference to the IUCN categories (1994). An analysis shows that the percentage of Vertebrate species at risk in Italy fluctuates, depending on which author is consulted, from 47.5% to 68.4%. In the case of Cyclostomes and freshwater Fishes, more than 40% of the threatened species were found to be in an especially critical condition (the IUCN categories of CR – critically endangered and EN – endangered), while with regard to Amphibians and Reptiles, respective percentages of 14% and 5% of the threatened species are endangered and very critically endangered (EN and CR categories). With regard to Birds and Mammals, respective percentages of 23% and 15% of the threatened species are in serious danger of extinction (CR and EN categories). As of today, there exists no similar evaluation for the levels of threat faced by Invertebrates.

Latest data show that vascular flora at risk include 1,020 species representing 15.2% of Italy's flora. The so-called "lower plants" must be added to this list with 40% of the known species found to be in danger; a high number of Hepaticae and Mosses is extinct (205 species) while many others of them are threatened with extinction (217 species); moreover, over 200 Lichens are included in the IUCN categories. Current knowledge of Italian plants at risk is far

from being complete since the conservation status of taxa has not yet been evaluated on the basis of quantitative criteria according to the new IUCN guidelines, however experts are working in this direction.

The monitoring of flora species protected under the Habitats Directive (see 2nd National Report on the implementation of the Habitats Directive covering 2001-2006) showed that the information available on many species is still insufficient, not updated or uneven throughout the country. Generally speaking, it can be assumed that the lack of information might have influenced the assessment in a way that the overall picture appears to be more positive than the real one.

On the other hand, the evaluation of the conservation status of animals may be defined favorable only for 23% of the species. For the 16 priority species provided by the Directive, the percentage of species in a poor status of preservation rises to 40% while the percentage of species in a favorable status of preservation drops to 17%. As for taxa, Invertebrates and Fishes of inland waters are in the most critical situation since only 12% of the cases are reported to be in a favorable status of preservation. If we consider that the status of conservation of 40% of freshwater habitats of Community interest is either inadequate or bad, it is obvious that more focused and effective actions than ever before must be taken to protect these species and their habitats.

The importance of habitat conservation is strongly emphasized by Directive 92/43/EEC which requires the protection of habitats and habitats of species, for their intrinsic value and rarity in Europe and because they are ecologically and functionally crucial for the conservation of species.

Due to its elongated shape extending from north to south and its peculiar geographical position (being in the center of the Mediterranean Sea and serving as a natural bridge between Europe and Africa), Italy plays an important ecological role at European level for the conservation of many migratory species belonging to different taxa (Birds, Chiroptera, Sea Turtles, Pelagic Fish, Cetaceans and several groups of Invertebrates, including the Lepidoptera).

The “ecological process” of animal migration in general and of bird migration in particular takes place on a broad geographical scale and involves all the territories, including land and sea as well as the airspace above them, that are located along migratory routes. Thus, to have a realistic chance of success, conservation strategies for the preservation of the migration process must operate on this scale, beyond the administrative boundaries of the States, and more so of the Regions, and require close cooperation and responsibility sharing among competent administrative authorities.

The widespread process of land use and environmental degradation threatens biodiversity and has a major impact on the conservation of habitats and species.

Direct consequences of the current urbanization rate include the reduction, fragmentation and erosion of habitats and impairment of their ecological - functional role with multiple negative effects on the survival of populations and species, soil permeability, raising of temperature and hydro-geological features. These processes, which also in Europe are seen as the main cause of biodiversity loss, generally lead to loss of ecological resilience. This situation is due, at least in part, to lack of, or to incomplete or unsatisfactory integration of biodiversity protection requirements in the territorial planning instruments for wide areas and local areas.

The abandonment of the countryside, especially in sub-mountainous and mountainous areas, and the progressive reduction of open areas being replaced by shrub and tree formations, the overall simplification of agro-ecosystems (mostly in hilly and plain areas) with the elimination of traditional landscape elements (hedges, tree lines, ponds and fountains), and the widespread use of pesticides, are critical issues for the biodiversity of these environments, which would benefit instead from extensive farming based on a multifunctional approach.

Moreover, mention should be made of the impact on all levels of biodiversity caused by the various types of pollution - air, water and soil pollution: these are ecosystem changes that often cause irreversible damage to the ecological functions of the environments, with both local and long distance consequences. In addition to directly damage biodiversity and the ecological processes, pollution has severe negative effects on ecosystem services and can be largely regarded as the consequence of lack of quantification of direct and indirect costs resulting from unsustainable development. A particular form of environmental pollution is caused by the dispersion of lead shot used in cartridges for hunting.

The impacts of climate change on biodiversity act through complex interactions, whose extent is difficult to fully assess; they can modify habitat structures and their ecological functions, by changing community composition and food webs, causing the displacement of communities through biocenosis, thereby affecting the physical elements of the ecosystem, the relationship between species and their ability to survive; this is particularly true for migratory species and mountain environments.

The most direct and immediate effects of climate change in our Country take place especially on mountain environments (the Alps and Apennines); their rugged topography, isolation and difficult access have helped maintain the relative integrity of their natural and cultural heritage as well as their extraordinary biological and cultural diversity.

Mountain environments are particularly fragile and vulnerable to climate change because:

- they undergo significant modification with only a small change in climate, as evidenced by the fluctuation of glaciers and permanent snowdrifts which is documented in historical records;
- the biotic communities in the high mountains are under conditions of high environmental stress, in the sense that abiotic factors, especially the climate, prevail over biotic factors;
- the high levels of biodiversity and endemism found in most mountainous biocenoses as well as their poor ability to migrate make Alpine and Apennine species highly vulnerable;
- a reduction in snow cover, which can usually isolate the soil from the surrounding environment, while maintaining the temperature close to 0° C and creating an environment conducive to microbial activity, increases the frequency of soil freezing and freeze-thaw cycles, thereby causing increased fine root and microbial biomass mortality.

The invasion of alien species in natural, agricultural and man-made environments is currently a further environmental emergency given the negative impact on biodiversity and ecological processes, the economic damage to many human activities and the relevant health problems it causes. The costs associated with the presence of Invasive Alien Species (IAS) are often particularly high and derive from the need for eradication and control of these species and from the direct damage to agriculture, fishing and human health as well as to biodiversity conservation of native species and natural habitats.

It should be noted that hunting pressure, which is practiced in over 83% of the Country, also causes an impact. Hunting pressure, expressed in terms of number of hunters per hectare of huntable land, is not uniform throughout the country: in some regions such as Umbria and Tuscany, for example, it is much higher than in others. In this respect, it should be noted that the hunting of species listed in the Birds Directive must be compatible with maintenance of the population of these species at a satisfactory level, i.e., the number of birds hunted must be compatible with the size and status of the populations that are subject to hunting and in compliance with the provisions and purposes set forth in the Birds and Habitats Directives. To that end, the geographic populations of the huntable species in Italy must be identified and monitored on a regular basis in terms of quantity and quality and regulations in this field, at national and regional level, must be also constantly checked for compliance with the two EU Directives.

Although poaching has significantly decreased in recent times, it is still carried out in Italy; it should be countered more effectively by means of synergistic and effective action aimed at preventing, controlling and repressing.

Building special infrastructure (e.g. MV/HV power lines, wind farms and lighting systems), in sites that are "sensitive" due to certain biodiversity components and without the technical solutions to mitigate the effects, is a real threat to the conservation of certain species.

The main threats to biodiversity in terms of species and habitats may be summarized as follows:

- loss of soil and change of its intended use as well as habitat modification and fragmentation;
- abandonment of traditional agricultural activities in mountain and sub-mountain areas and simplification of agro-ecosystems in hilly and plain regions;
- pollution to environmental media (water, air, soil and acoustic and light pollution);
- climate change resulting from variations of air pollutant concentrations such as CO_2 CO, CH_4, O_3 and others, especially in mountain environments;
- spread of invasive alien species;
- indirect disturbance related to hunting pressure;
- poaching;
- construction of infrastructure in areas of biodiversity interest (MV/HV power lines, wind farms, lighting systems and large-scale photovoltaic plants).

Many of the identified threats are related to the failure to implement, in a pragmatic and rigorous way, the existing laws on the use of natural resources and assessment procedures, as well as to the lack of adequate rules on the sustainable use of the environment aimed at preventing the depletion of species and the deterioration of habitats and landscapes.

The Government, the Regions and Local Bodies should jointly develop and enact policies on the preservation and restoration of species, habitats and landscape for the whole national territory. These policies should recognize the intrinsic value and importance, also in economic terms, of the complex mosaic of ecosystems, which provides ecosystem services that are essential to us and which represents our landscape, thereby making it a resource of national importance. These policies should also guarantee the objectives of biodiversity and ecosystem conservation through planning that integrates conservation, restoration and sustainable use of the elements of the territory, by reducing fragmentation and implementing programs and measures that guarantee and restore adequate ecological connectivity.

The following specific objectives must be achieved by 2020:

1. improving data and filling knowledge gaps on the substance, characteristics and conservation status of habitats and species and their ecosystem services as well as on direct and indirect threat factors;

2. improving data and knowledge on the value of ecosystems and their services by identifying the potential beneficiaries and stakeholders who play an effective role in the management of these systems;
3. promoting the sustainable use of natural resources and introducing the application of the ecosystem approach and of the precautionary principle in their management;
4. integrating biodiversity in laws and in large scale and local planning tools to ensure the continuous flow of ecosystem services and the ability to mitigate and adapt to climate change;
5. enacting policies aimed at ensuring the satisfactory conservation status of habitats and native species also through the implementation of pilot projects for their in situ and ex-situ protection and recovery;
6. implementing a policy of careful assessment of the risks associated with the use of genetically modified organisms (GMOs);
7. implementing policies aimed at solving the problems caused by IAS;
8. implementing policies aimed at improving the sustainability of hunting in compliance and in line with national and EU standards and guidelines;
9. implementing policies on the conservation of migratory species;
10. implementing policies aimed at mitigating the impact of infrastructures on species and habitats;
11. implementing policies aimed at reducing the impact of hazardous and toxic substances on species and habitats;
12. implementing policies aimed at significantly reducing poaching activities;
13. implementing policies aimed at removing and/or mitigating the underlying causes of anthropogenic climate change while implementing an adaptation strategy aimed at reducing the impact of climate change on the species and habitats used, with special reference to migratory species and mountain environments;
14. developing permanent monitoring activities for migratory species in relation to climate change.

The following priority measures have been identified:

a) promoting programs and initiatives aimed at improving knowledge of the consistency, distribution, characteristics and conservation status of habitats and species and of direct and indirect threat factors, pursuant to the provisions of the Global Taxonomy Initiative (GTI) of the CBD;
b) developing, testing and implementing the monitoring protocol of the conservation status of all habitats and species of EU interest throughout the Country by 2020;
c) carrying out initiatives to promote monitoring of the consistency of huntable species listed in the Birds Directive;
d) implementing a permanent monitoring program for migratory species (Birds, Chiroptera, Cetaceans, Pelagic Fish, Sea Turtles, Lepidoptera) also to detect and map current sensitive

areas that are part of the scenario caused by climate change and to take specific protective measures;

e) establishing in situ and ex situ conservation programs for habitats and species, with special reference to those that are of EU interest, endangered, rare or endemic, aimed at strengthening natural indigenous populations;
f) implementing actions to improve and restore ecological functions of habitats with special reference to agricultural areas, forests, coastal and river regions and small islands;
g) implementing programs and initiatives aimed at preventing the introduction and invasion of alien species, ensuring the rapid identification and removal of new settlements, carrying out coordinated actions for the eradication and control of species that are already established in the Country and for the mitigation of impacts on the most affected species and ecosystems;
h) implementing programs and initiatives aimed at assessing the risks arising from the introduction of GMOs;
i) developing guidelines for mitigating biodiversity impacts resulting from the implementation of infrastructure located in areas of biodiversity interest;
j) implementing the NBN (see pages 152-153) as an Italian biodiversity network made up of Observatories established at a national and regional level;
k) prohibiting the use of lead shot for hunting purposes within SPAs and starting the procedure to extend it to all wetlands, as required by the AEWA;
l) implementing programs and initiatives aimed at improving the effectiveness and efficiency of the prevention, control and repression of poaching.

Landscape

2010 marked the tenth anniversary of the European Landscape Convention which was signed in Florence on October 20, 2000.

The Convention was aimed at promoting landscape protection, management and planning and committed the Regions and Autonomous Provinces to recognize landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity.

The Convention also required that landscape policies aimed at landscape protection, management and planning be established and implemented through the adoption of specific measures, by establishing participation procedures and integrating landscape into regional and town planning policies and into cultural, environmental agricultural, social and economic policies, as well as in any other policies with possible direct or indirect impact on landscape.

The relationship between biodiversity and landscape was explicitly mentioned in the preface of the Convention, having regard to the legal texts existing at an international level in

the field of protection and management of the natural, cultural heritage, regional and spatial planning, taking into account the most advanced scientific and cultural suggestions that have been made at an international and European level in the past twenty years with regard to assessing, programming and planning measures in terms of sustainability.

According to the Italian legislation, the Code of the Cultural and Landscape Heritage (Legislative Decree No. 42 of January 22, 2004, and as subsequently amended) governs, as described in the third part, the protection and enhancement of landscapes, even as regards the implementation of the European Landscape Convention and the related rules for its ratification and enforcement.

Urban planning in the traditional sense, the one established by Law No. 1150 of 1942, started a process of mutation powered by three driving forces in the mid-1970s:

- administrative decentralization which has gradually expanded the number of entities who are involved in territory related activities;
- emergence, development and dissemination of issues concerning the protection of nature and the environment, which have imposed on urban planning to overcome, at least formally, the purely functional approach and adopt a new logic of saving, protecting and managing natural resources;
- increasing recognition of existing interrelationships between the various subjects and activities of territorial significance, the ensuing need for less sectoral administrative activities, and activities that are more and more open to inter-institutional cooperation and the pursuit of mutual coherence and synergy.

The notion of urban planning turning into territorial governance is not just a semantic shift; it is rather a profound change in meaning brought about by – even contradictory - cultural progress and administrative procedures that have set as their goal, at least formally, the sustainable use of resources as well as unanimous decisions on the part of the stakeholders involved.

As is known to all, despite a debate that has been going on for over 40 years, the National Urban Planning Law has not yet been “reformed” and thus thinking about its possible and rightful contents in terms of biodiversity protection is a very topical subject today.

The Regions impose specific rules for use of their entire territory. They do so by approving landscape Plans, meaning urban - territorial plans that give specific consideration to landscape values, concerning the whole regional territory.

With regard to the analysis of landscape features imprinted by nature, based on which the landscape Plan is developed and according to an ecosystem approach, it is evident that the ecosystem structure and operation must be properly assessed while safeguarding landscape environments and defining the related requirements and provisions of the Plan.

The landscape quality objectives assigned to each area by the Landscape Plan will also be inclusive of biodiversity conservation objectives.

In this sense, the planning, construction and maintenance of large scale "ecological networks" may be the operational tools to be used to achieve the proposed synergy between landscape policies and biodiversity conservation.

In following this approach, the determining difference between a territory with high nature value or a territory with little or no nature value is replaced by the notion that the conservation of biodiversity and the most important ecological processes may not be pursued by only safeguarding protected areas; rather, it is necessary to use different models of environmental management, which, in fact, are listed under the planning category of "ecological networks" in the specialist literature that has been produced since the mid-90s.

Assigning a relational ecological meaning, thus a role in the ecosystem that is not necessarily secondary, to fallow land, abandoned cultivated fields, burned areas, degraded forest land and other areas that traditional urban development has always viewed as non-essential and often as an unavoidable part of pre-urbanization, requires a major overhaul of the programming paradigms and causes, within the balance of current productive, entrepreneurial and political interests of the territory, certainties to falter and change; this may lead, at least in the early stage, to vigorous opposition.

This approach shows that it is impossible to preserve species, communities and ecosystems according to constraints having thresholds such as "all (for protected areas)" and "none (e.g., for marginal, degraded and developing areas)" and that it is essential to highlight trends in time and heterogeneity in space, according to an approach that takes into account the environmental gradients (e.g., resources, organisms and processes).

The conceptual framework of ecological networks sparked the interest of institutions in 1998 when the MIUR - Ministero dell'Istruzione, dell'Università e della Ricerca (Ministry of Education, University and Research) funded a two-year program of national interest as part of PRIN - Programmi di Ricerca di Rilevante Interesse Nazionale (Research Programs of Relevant National Interest), proposed by university-based research units and referred to as Planeco (Planning in Ecological Network), aimed at implementing territorial planning policies based on environmental continuity structures. Again in 2002, the Nature Conservation Service of the MATTM commissioned the master plan of the National Ecological Network (REN) and promoted a further national study regarding the Apennines Park of Europe (APE) project.

Prior to that, the "Nature Chart" project, introduced by Law No. 394/91, and first entrusted to the National Technical Services and then to former APAT (now ISPRA – Istituto Superiore per la Protezione e la Ricerca Ambientale – National Institute for Environmental Protection and Research), was aimed at evaluating the status of Italy's natural environment, by assessing the Country's natural values and the environmental vulnerability, in order to define the "land-use planning". After the Nature Chart was established on 1/5 of the territory, it is now being expanded in collaboration with the Local Bodies (ARPAs – Agenzie Regionali per la Protezione dell'Ambiente (Regional Agencies for Environment Protection); the Regions and

Parks)). At a European level, the Habitats Directive, along with Natura 2000 Network, has laid the foundations for the creation and development of one of the most ambitious and successful projects which goes in that direction.

The integration of biodiversity into the various sectoral plans and programs, including territorial and landscape planning, has not yet met with a widespread, satisfactory response at a national and regional level.

In this sense, land-use planning should be identified as soon as possible, given that it is an essential tool to bring back action to the territory at a national strategic level. In this way, measures can be optimized and impacts mitigated that are caused by decisions made for the mapping of important public works (e.g., infrastructures and large power plants) that are not based on territorial knowledge.

To that end, it is essential to exchange methodological, technical and also political information on new landscape planning to ensure that land-use planning identify biodiversity conservation as one of its strategic objectives.

By placing these issues in the spotlight, the Strategy's objective is to create a reference framework designed to offer guidance and coordination to implement policies, programs and initiatives aimed at integrating biodiversity conservation issues into the various land-use planning instruments, at different scales, while promoting synergy between the government and competent administrative bodies in order to harmonize conservation with the sustainable use and transformation of the territory.

In this sense, it is also appropriate to highlight the importance of ecosystem services with regard to the defense of the Territory from hydro-geological hazards (landslides and floods) that occur every year in our Country. A more effective integration of biodiversity into programming and planning activities, at all administrative levels, is the key to preventing, reducing and offsetting negative environmental effects on biodiversity and the ecosystem services it provides.

The Habitats and Birds Directives and the Environmental Impact Assessment (EIA) established that potential adverse impacts on biodiversity caused by plans, programs and projects must be duly taken into account.

The Strategic Environmental Assessment (SEA), under Directive 42/2001/EC, which is applicable in some plans and programs, is aimed at reconciling the needs of biodiversity conservation with those of economic development, while ensuring that the potential impacts on biodiversity are taken into account at an early stage in the planning process and that alternative solutions are identified which will have less impact.

The main critical issues in biodiversity that emerge from the analysis of the topics covered in this work area can be summarized as follows:

- loss of soil and change of its intended use resulting in irreversible habitat loss, modification and fragmentation;
- simplification and loss of identity of the landscape, resulting in the removal, modification and fragmentation of habitats and related communities and in reduced social, aesthetic and recreational values;
- land use conflicts that undermine its ecological functions (rapid and significant expansion of infrastructure and conurbations);
- insufficient integration of biodiversity into planning instruments;
- insufficient evaluation of ecosystem services in terms of hydrological hazard prevention on the territory;

A new perception of landscape values should be promoted in order to bring about changes in land use and economic and social development patterns.

In this context, planning for large areas plays a strategic role as an integration instrument for various policies and interests that are within the territory and influence its features; it requires the establishment of inter-institutional cooperation and the involvement of local communities and stakeholders, through negotiated planning mechanisms, possibly also between public and private sectors, that can develop innovative and sustainable systems for the procurement of financial resources. The European Landscape Convention provides the appropriate reference framework that offers guidance and methodologies to conduct landscape planning according to sustainable criteria that can also ensure the conservation of biodiversity elements.

The following are the specific objectives for this work area to be achieved by 2020:

1. implementing policies aimed at reducing and planning the annual rate of soil that is subject to transformation by promoting recovery and transformation programs in already urbanized areas;
2. implementing policies aimed at integrating specific biodiversity conservation objectives into landscape plans, pursuant to the "Code for Cultural Heritage and Landscape (Legislative Decree No. 42 of January 22, 2004 and subsequent amendments) in relation to the landscape quality objectives laid down for the identified landscape areas;
3. implementing policies aimed at integrating biodiversity issues, in legislative terms, into large- and local-scale planning instruments, thereby defining the minimum cognitive content in relation to this topic area;
4. implementing policies aimed at promoting the integration of landscape planning at all levels to ensure biodiversity conservation for its intrinsic value, the flow of ecosystem services and the ability to mitigate and adapt to climate change;
5. implementing policies aimed at establishing participatory mechanisms for land-use planning that are based on the vulnerability, weakness and potential of the natural systems in the area;

6. developing effective policies for the prevention of sudden-onset natural calamities (e.g., landslides, floods, etc..) and slow-onset disasters (e.g., desertification, coastal erosion etc..) and effective mitigation of the same, thereby preserving environment resilience, promoting the conservation and recovery of natural conditions and local accountability in relation to disasters.

   The following priority measures have been identified:

   a) promoting the updating of national legislation regarding the use, transformation and protection of the environment taking into account the most advanced scientific and cultural suggestions that have been made in terms of evaluation, planning and programming as well as integration of biodiversity topics;
   b) promoting the use of planning methodology for large scale ecological networks as an integral and prescriptive part of land-use planning, also through the drafting of specific guidelines;
   c) implementing programs and projects aimed at completing the process started with the Nature Chart project and identifying the "land-use framework";
   d) promoting the integration of the "no-cost urban budget" into large- and local-scale land-use planning, as the balance between new consumption forecasts of surface areas and the restitution of equivalent parts or an otherwise determined extent to at least a semi-natural status.
   e) promoting initiatives aimed at improving the effectiveness of the SEA and EIA, as instruments for the prevention, minimization and mitigation of impacts on landscape, habitats and species, by implementing policies and guidelines;
   f) promoting synergies between the National and Regional Landscape Observatories and the Observatories for Biodiversity, by implementing the NBN;
   g) implementing programs and projects aimed at:
      i. recognizing, enhancing and preserving ecosystem services as effective tools for the prevention of sudden-onset natural calamities (e.g., landslides, floods, etc..) and slow-onset disasters (e.g., desertification, coastal erosion etc..) and effective mitigation of the same;
      ii. preserving environment resilience, promoting the conservation and recovery of natural conditions and local accountability in relation to disasters;
      iii. restoring the socio-economic, landscape and natural values of areas undermined by high concentration of human activity or abandonment of marginal areas.

Measures at an International and European level:

[*Omissis*]

Measures at a national level

Habitats and Species

Law No. 157 of February 11, 1992, subsequently amended by Law No. 221 of October 3, 2002, laid down the rules on the Protection of Warm-blooded Wild Fauna and Hunting. Wildlife is declared to be "State property" and is protected in the interest of the national and international community. Wildlife includes all species of mammals and birds that exist in populations living permanently or temporarily in a country, in a state of freedom. Thus, all warm-blooded wildlife species are protected except for the huntable species listed under Article 18. Moreover, the species listed in Article 2 (Table 1) are specially protected species, also in terms of sanctions. Finally, the Law also transposes Directive 79/409/EEC into Italian Law.

Presidential Decree No. 357 of September 8, 1997 "Regulation implementing Directive 92/43/EEC on the conservation of natural and semi-natural habitats and of wild fauna and flora" is the legislative instrument for the transposition of the Habitats Directive which illustrates its objectives, a roadmap of ways to achieve them, and conservation measures, including management plans and impact assessment.

Presidential Decree No. 120 of March 12, 2003, is the legislative instrument for the modification and integration of Presidential Decree No. 357/97 which transposes the provisions of the Habitats Directive in a comprehensive manner, while complying with the Commission's requests.

To complete the list of measures at a national level, the provisions at a regional level must not be left out. The following points are worth mentioning:

- the law on the protection of native plants, issued by the Regions and Autonomous Provinces, containing lists, usually attached, of the species to be protected;
- the law on the protection of the wild fauna, issued by the Regions and Autonomous Provinces, usually accompanied by attached lists of the protected species, including specific provisions on the protection of minor fauna.

Landscape

Law No. 14 of January 9, 2006, "Ratification and implementation of the European Landscape Convention, signed in Florence on October 20, 2000", gave full and complete effect to the European Convention.

The Code of the Cultural and Landscape Heritage, issued through Legislative Decree No. 42 of January 22, 2004 of the Ministry for Cultural Heritage and Activities, Part III, (as amended by Legislative Decree No. 157 of March 24, 2006 and Legislative Decree No. 63 of March 26, 2008) regulates the protection of landscape assets, and indicates that the national implementation of the Convention must be carried out according to the specific division of

competences established by one's own legal system, in compliance with one's own constitutional principles and administrative organization and with the principle of subsidiarity. The current operational phase involving the MATTM calls for the participation in the drawing up of Territorial Landscape Plans, with the cooperation of the Regional Authorities which, on a voluntary basis, propose the signing of specific agreements. Within this regional context, it is important to support an interdisciplinary relationship among the various competences in order to ensure the best procedural requirements for valid project results. The ensuing method could become a model to be applied not only within the region but also at a broader level, in view of the introduction of a new national legislation.

Resolution No. 229 of December 21, 1999, "National Program to Combat Drought and Desertification", issued by the CIPE - Comitato Interministeriale per la Programmazione Economica (Interministerial Committee for Economic Planning), called for the identification of national activities to combat desertification, through the following main criteria:

- ensuring integrated protection of land, water, vegetation, landscape and human labor in the areas affected by degradation;
- implementing and exploiting existing national standards and existing EU legislative instruments, thereby promoting the enforcement of effective laws and programs by the Regions;
- ensuring connection and synergies with other global conventions on climate, biodiversity conservation and the protection of international waters;
- adopting measures for the sustainable development of affected areas;
- promoting the involvement of citizens and businesses in making choices and implementing measures.

Legislative Decree No. 152 of April 3, 2006, "Regulations on the environment" and subsequent amendments, Part III, set out the actions to be implemented to ensure the protection and remediation of soil and subsoil, the hydrologic restoration of the area through the prevention of instability phenomena, the implementation of safety measures for risk situations, the protection of water resources and the fight against desertification.

2. Protected Areas

The protected areas arising from the relevant national legislation and the ones established and designated under EU directives (Natura 2000 Network) are both addressed in this work area.

Protected areas represent a fundamental and indispensable tool to implement biodiversity conservation strategies and maintain the Planet's ecological processes. In recent years, international policies on nature conservation have been supplemented by new conceptual and operational guidelines, requirements and strategies, which are the result of cultural, scientific and political experiences that have updated the mission of protected areas, by making it more effective and modern compared to the targets of biodiversity conservation. Other important objectives to be integrated with these targets include: the fight against poverty and a true sustainable development. Protected areas must then add to their primary and indispensable objective of serving as laboratories aimed at conserving and increasing biodiversity, some supplementary services through the development of environmentally, economically and socially sustainable activities. The effectiveness of protected areas is connected to the support they receive from local communities who live within these areas or that depend on them, as well as on other stakeholders at a local, national, regional and global level.

20 years after the entry into force of the framework law on protected areas (Law No. 394/91), the situation of Italy's protected areas has improved considerably, as figures show: in the past few years, Italy has established the highest number of protected areas in Europe, partly making up for the delays that occurred before the 1991 Law.

According to the 5th Update of the EUAP - Elenco Ufficiale delle Aree Naturali Protette (Official List of Protected Areas) of 1993, 772 protected areas were established in Italy, covering 2,911,582 hectares of terrestrial land surface and 2,820,673 hectares at sea, corresponding to 9.66% of the national territory. Information up until 2010 that can be found in the 6th EUAP Update, whose publication is under way, shows an increase of 99 protected areas for a total of 871 areas and 3,163,591 land hectares, equivalent to 10.42% of the national territory, and a total of 2,853,034 sea hectares.

With regard to marine protected areas, regulatory forecasts have identified 52 potential areas whose protection, through the establishment of marine protected areas, is deemed a priority: protection provisions have already been implemented in 32 of these areas, including 27 marine reserves, 2 national parks extending into the sea, 2 underwater archaeological parks and a large international marine mammal sanctuary.

In addition to the protected areas included in the EUAP, pursuant to Law No. 349/91, there are 400 other areas in Italy covering about 430,000 hectares of national territory that are subject to special protection.

Italy's protected areas have played and still play a strategic role in terms of biodiversity conservation given the extensive territorial expansion and for the following reasons:

- they act as real "reservoirs" and serve as natural laboratories for the conservation of the territory, landscape, ecosystems, habitats and species;
- they substantially contribute to the maintenance and enhancement of good practices and traditional cultures, with special reference to agriculture and fishing;
- they play a pivotal role in spreading environmental education and training of new generations on the intrinsic importance of biodiversity and the sustainable development and economic opportunities arising from it;
- they ensure, enhance and promote the benefits of ecosystem services;
- they are privileged places for the promotion, practice and dissemination of scientific research, the development of integrated planning methods and participatory processes for land management and sustainable development;
- they are places for exercising and testing tourist patterns aimed at increasing environmental sustainability awareness;
- together with the Natura 2000 Network, they are essential elements for defining "ecological networks", acting as nodes, corridors and stepping stones;
- they are the repositories of valuable know-how on natural resource management and internal organization procedures to be used and transferred to the field of international cooperation initiatives, with particular reference to the Mediterranean Sea;
- they are an "integrated development model" which, even if implementable, represent a tangible example of the effective feasibility of procedures that employ conservation and promotion of biodiversity as the main drive for the achievement of social welfare and opportunities for local sustainable development.

However, some significant critical issues still remain that can be summarized as follows:

- lack of a strategic, systematic and synergistic approach to the management of protected areas, at a central and local level;
- shortage and uneven availability of basic naturalistic, social and economic knowledge to be used as reference for operational and management decisions;
- lack of specific training to enable personnel in the protected areas to achieve a uniform professional level in all positions;
- lack of perception of opportunities and the potential for economic and social development offered by protected areas, widespread inclination among administrations, local communities and stakeholders to highlight only obligations and prohibitions;
- slow approval processes for planning and socio-economic development tools;
- slow establishment procedures and slow development of marine protected areas,

- lack of shared patterns for the environmental and economic assessment of the efficiency and effectiveness of protected area management to be used at a central, regional and provincial level;
- lack of professionals who have the technical knowledge and skills in the field of management which has an impact on the achievement of conservation objectives and sustainable development;
- lack of funding at a state and regional level, in relation to the quality and quantity of the services and the often inconsistent and ineffective use of available funds for the achievement of conservation objectives, as provided by national legislation.

Therefore, it is necessary to give strong impetus to the management of protected areas, in order to create synergies, while sharing conservation and sustainable development objectives, investing significant energies and resources, and calling for the beginning of a "special" programming and project phase to be started on the International Year of Biodiversity, with the Strategy being its reference point.

Thus, the following objectives must be achieved by 2020:

1. promoting an effective national policy for protected areas, that is fully integrated into strategies for conserving nature and supporting the Country's economic development and territorial cohesion, and is based on the identification of common and differentiated, farsighted and ambitious objectives and the strategies that should be adopted to achieve them.
2. laying the foundations for a real systematic approach to protected areas while promoting, in particular, the creation and strengthening, where existing, of technical facilities at a state, provincial and regional level, to ensure the development of the protected area system in terms of ecological, social and economic performance by providing assistance and qualified services;
3. completing the approval process of instruments for the planning, management and socio-economic development of national and regional protected areas which should include specific measures aimed at conserving habitats and species of EU interest, if available, and monitoring their effectiveness in terms of biodiversity conservation;
4. turning protected areas into focal points for research and monitoring networks in the territory in terms of biodiversity and into a unique forum for cooperation with the research world;
5. making up for the delays in the establishment and start-up of marine protected areas;
6. supporting the protected area system by providing adequate financing.

The following priority measures have been identified:

a) filling in the basic knowledge gaps regarding naturalistic and socio-economic issues to be used as reference points for operational and management decisions;
b) providing protected areas with a common set of shared and discussed indicators, under the terms of unanimous consent agreements, to verify the effectiveness and efficiency of man-

agement, in order to monitor and measure progress and critical issues in terms of adaptive management;

c) promoting training of protected area personnel, knowledge sharing and good practice programs;
d) developing programs and projects to raise awareness, information dissemination, interpretation of and education on issues regarding biodiversity and its conservation, also from a global standpoint;
e) adopting selection criteria based on specific curricular contents in identifying personnel to include in management bodies;
f) developing concrete conservation projects on species, habitats, ecological processes and ecosystem services as part of a cohesive and shared project;
g) adopting the European Charter for Sustainable and Responsible Tourism by the National Parks and carrying out actions aimed at promoting new businesses in the area for biodiversity enhancement;
h) promoting programs and projects aimed at improving the traditional knowledge of local communities by involving them in the management of the territory and protected area services with an eye to the ecosystem approach.

Natura 2000 Network is the cornerstone of EU biodiversity conservation policy. It is an EU-wide network of nature protection areas established under the 1992 Habitats Directive which, along with the Birds Directive, has provided a common framework for conserving natural and semi-natural habitats of the wild fauna and flora of special EU interest and represents the main European initiative aimed at preserving the biodiversity of the Member States. According to the principle of subsidiarity, in Italy the identification and management of the sites belonging to Natura 2000 Network have been entrusted to the Regions and Autonomous Provinces. During the implementation process of the Habitats Directive, 2,288 SCIs and 597 SPAs have been identified in Italy; the Natura 2000 Network areas cover a land surface of over 20% of the Country.

There are three bio-geographical regions in Italy and the SCI lists have been adopted for each one of them as a result of the following selection decisions of the European Commission which were later updated:

- decision 2003/69/EC for the sites of Community Importance for the Alpine bio-geographical region;
- decision 2004/798/EC for the sites of Community Importance for the Continental bio-geographical region;
- decision 2006/613/EC for the sites of Community Importance for the Mediterranean bio-geographical region.

Pursuant to the Habitats Directive, within 6 years from the date of selection of the SCIs by the European Commission, the Member States should designate the Special Areas of Conservation (SACs) and the measures for their preservation should be defined.

Therefore, by 2009, the SACs of the Alpine bio-geographical region and by 2010 the SACs of the Continental bio-geographical region were to be defined; by 2012 the SACs of the Mediterranean bio-geographical region will have to be defined.

The DM of September 3, 2002 "Guidelines for the management of Natura 2000 sites" provided information on the preparation of Natura 2000 management plans. Decree No. 84 of October 17, 2007, issued by the MATTM, provided the minimum uniform criteria for establishing conservation measures in relation to SACs and SPAs which the Regions had to comply with by having their own regulations and provisions transposing the Decree into law. To date, almost all Regions have formally transposed the DM although at different levels of compliance.

In the past few years, several Regions and Autonomous Provinces have seized the opportunities offered by the 2006-2007 and 2007-2013 EU programming for preparing the management instruments (management plans and conservation measures) of the Natura 2000 sites. This process is still ongoing and is closely linked to the definition of site-specific conservation measures that are necessary for designating SCIs in SACs.

The impact assessment, introduced by Art. 6 of the Habitats Directive, if implemented correctly, would be a great opportunity to achieve the right balance between the objective to maintain or restore a favorable conservation status of habitats and species of EU interest and the sustainable use of natural resources.

The overall quality of the impact studies is critical and often does not meet the purposes of the procedure; even the situation of the offices that are responsible to provide an opinion on the matter is rather inconsistent and appears to be problematic due to staff downsizing and lack of professional skills that are necessary to carry out the procedure.

In order to meet the commitments under the Habitats Directive in the marine environment and under Target 2010, Italy has started to identify sites in territorial waters and survey extraterritorial waters, on a scientific basis; at the same time, consultations have begun with Regional Authorities to complete the designation process of SCIs in territorial waters and to establish appropriate management and conservation measures.

As highlighted above, the most significant critical issues can be summarized as follows:

- delay in the definition of site-specific conservation measures for the designation of SACs for the Alpine bio-geographical region and the need to strongly boost Continental and Mediterranean bio-geographical regions;
- inadequate and incomplete implementation of DM No. 184 of October 17, 2007 by various Regions and Autonomous Provinces and problems with its application;

- lack of identification of the operators managing the Natura 2000 sites, in particular the SPAs, by various Regions and Autonomous Provinces;
- insufficient integration of management Plans into other Plan instruments, with particular reference to those of the Protected Areas and problems in their approval and implementation as autonomous instruments;
- unsatisfactory application of the impact assessment procedure;
- delay in the identification and designation of SCIs and SPAs in the marine environment;
- lack of perception of opportunities and the potential for economic and social development offered by Natura 2000 Network and widespread inclination among administrations, local communities and stakeholders to highlight only obligations and prohibitions;
- problems in the start-up and expenditure measures of the Rural Development Plans (RDP) dedicated to Natura 2000;
- knowledge gaps and failure to organize the available information regarding distribution and conservation status of habitats and species of Community interest across the whole national territory;
- difficulty in starting an effective, efficient and widespread monitoring program on the conservation status of habitats and species of Community interest, established according to standardized and shared methodologies and involving significantly protected areas, their personnel and their know-how;
- lack of economic resources for the effective management of Natura 2000 Network and the often inconsistent and ineffective use of available funds to achieve the objectives of the Directive.

The following specific objectives that are being proposed are to be achieved by 2020:

1. implementing policies aimed at completing and supporting the management of the Natura 2000 Network in the terrestrial and marine fields and ensuring its development and promotion as added value to the economic and social development programs of the territories through an appropriate and consistent use of the Structural Funds and of the EU CAP funding and the strengthening of mechanisms and participation modalities also in order to highlight the benefits and the obstacles that must be overcome;
2. enhancing the effectiveness and efficiency of the impact assessment procedure at a central and peripheral level;
3. defining the monitoring protocols while envisaging the roles and modalities of data collection, transfer and validation, aimed at assessing the conservation status, consistency and characteristics of habitats and species of Community interest, with special emphasis on the priority ones, while identifying favorable reference values and direct and indirect threat factors across the national territory, through the use of comparable and shared methodologies;

4. strengthening the integration of the Natura 2000 Network and conservation measures dedicated to habitats and species of Community interest, using the existing planning instruments while enhancing and improving the value and cogency of Management Plans and the management information contained therein.

The following priority measures have been identified:

a) implementing the actions and synergies that are necessary to quickly designate SACs and identify the related conservation measures according to the deadlines established by the European Action Plan;
b) implementing the actions and synergies that are necessary to promptly complete the Natura 2000 Network in the marine environment;
c) implementing programs and projects aimed at strengthening the offices in charge of issuing opinions on impact assessments, while increasing the number of qualified personnel and promoting effective training activities, at a central and peripheral level;
d) implementing national guidelines on impact assessments which, among other things, clarify the most problematic concepts such as, for example, "mitigation measures" and carrying out the revision of Annex G of Presidential Decree No. 120/2003 in order to improve the effectiveness and efficiency of the procedure;
e) adapting and completing the transposition of DM No. 184 of October 17, 2007 at a regional level in order to develop effective and harmonized conservation measures for our Country's sites while ensuring the same level of protection and to actually develop measures that need to be promoted within the sites;
f) identifying operators managing the sites with special emphasis on the SPAs, by the Regions and Autonomous Provinces who have not yet acted in this direction;
g) approving the completed Management Plans and applying the management guidelines contained therein;
h) beginning monitoring Plans at a regional level with the support and involvement of the protected areas and their qualified personnel;
i) creating a significant and wide spread communications campaign, at a national level, on the Natura 2000 Network, involving all competent authorities and the protected areas, especially National Parks, in order to improve knowledge of biodiversity values and increase the social acceptance of the Network, thereby highlighting its cultural importance and the potentials for development, including tourism, which can arise from its appropriate and long-lasting application;
j) increasing and optimizing the identification of European funds that are needed to ensure the supervision, management and monitoring of sites belonging to the Natura 2000 Network and guarantee that the use of existing funds is more consistent with the goals of the Directive and focused on the achievement of objectives related to biodiversity conservation, management, education, training and sustainable development.

Measures at an international and European level

[*omissis*]

Measures at a national level

The framework law on protected areas No. 394 of December 6, 1991, as amended and supplemented by Law No. 426 of December 9, 1998: "New measures in the environmental field", "sets fundamental principles for the establishment and management of protected natural areas, to ensure and promote, in a coordinated fashion, the conservation and enhancement of the natural heritage of the country". The areas with significant natural and environmental value are subject to a special protection and management regime in order to especially achieve the following purposes:

- conservation of animal and plant species, plant or forest associations, unusual geological and paleontological formations, biological communities, biotopes, scenic and landscape values, natural processes, hydraulic and hydro-geological balance and ecological balance;
- implementation of management or environmental restoration methods that are suitable to integrate man with the natural habitat, also through the protection of anthropological, archaeological, historical and architectural values and agro-forestry-pastoral and traditional activities;
- promotion of educational and training activities, scientific research, also of an interdisciplinary type, as well as compatible recreational activities;
- defense and recovery of hydraulic and hydro-geological balance.

The Decree of September 3, 2002, issued by the MATTM, titled "Guidelines for the management of the Natura 2000 Network sites" acts as technical and regulatory support for the development of appropriate conservation measures, including management plans for the Natura 2000 Network sites.

Decree No. 184 of October 17, 2007, issued by the MATTM is the legal instrument through which uniform minimum standards were enacted to establish conservation measures for SPAs and SACs, which the Regions had to comply with, by having their own regulations and provisions transpose the Decree into law, at least with regard to the SPAs. The Decree also identifies the procedure for designating SACs and in fact, Article 2 requires that, in compliance with the decrees issued by the MATTM, adopted in consultation with the Regions and the concerned Autonomous Provinces, the SACs be designated and conservation measures be identified to maintain a favorable conservation status of habitats and species for which the site has been designated.

With Resolution of March 26, 2008 issued by the Permanent Conference on relations between the State, the Regions and the Autonomous Provinces of Trento and Bolzano, which amended the Resolution of December 2, 1996 issued by the Committee on Natural Protected Areas, the sites of the Natura 2000 Network were classified as "protected areas" while distinguishing them from parks and reserves, because the latter are subject to the "conservation measures" established by the Regions and the Autonomous Provinces of Trento and Bolzano, in compliance with DM 184/2007.

Pursuant to the decrees issued by the MATTM, the lists of SCIs found in Italy in the three bio-geographical regions, i.e., the Alpine, Continental and Mediterranean regions, are updated on a regular basis. The last updated SCI lists were published in the August 2010 Official Gazette.

The Decree of June 19, 2009 issued by the MATTM, titled "List of Special Protection Areas (SPAs)", classified pursuant to Directive 79/409/EEC, updated the list of designated SPAs in our Country.

3. Genetic Resources

Genetic diversity refers to genetic variability within a single species and includes the genetic variation between different populations of the same species and genetic variation within a single population. It is the fundamental component of biological diversity, through which the set of species and natural communities has developed in the course of natural evolution and will continue to develop by means of natural selection processes and adaptation to environmental changes.

Genetic diversity not only involves individuals but it also characterizes groups of individuals who possess very similar traits within the same species (populations). Populations belonging to the same species share the same gene pool and keep more or less isolated from each other, usually by means of geographical barriers. If the populations who carry most of the variability become extinct, natural selection has less genetic variation upon which to act and thus, the species have a lesser chance of surviving.

The loss of genetic variability in a species is called "genetic erosion".

The destruction and/or fragmentation of the territory, limiting or preventing the spread of genes between populations (gene flow) and the size of the remaining natural populations is in fact a threat to biodiversity, especially to genetic diversity. Other threats to genetic diversity are: invasive alien species, pollution, human pressure, over-collection of wild plants and poaching of wild animals, the escape of farmed organisms and over-harvesting of wild species. Genetic diversity within a given species is the basis of any genetic improvement practice, which can be measured in terms of increased productivity, disease resistance and adaptation to particular breeding and cultivation conditions. This is particularly important in areas such as aquaculture, where the processes of domestication are still at an early stage.

Genetic diversity is thus vitally important for human consumption and for obtaining plants and animals that are essential for man's life. It is no coincidence that FAO's Treaty on Plant Genetic Resources (2001) defined them as any genetic material (thus capable of transmitting hereditary traits) of plant origin of actual or potential value for food and agriculture. Similarly, the 1995 FAO Code of Conduct for Responsible Fisheries and Aquaculture stipulated that States should conserve genetic diversity through appropriate management, in particular by trying to minimize the harmful effects of introducing non-native species or genetically modified stocks into waters.

The CBD considers the access to genetic resources, their sustainable use and the equitable sharing of benefits derived from them one of the major global challenges because of the various economic and political interests that are involved at a local and international level. The third of the Convention's three objectives is dedicated to this topic.

The use of genetic resources in agriculture, forestry and industry, plays a key role in the economy. Despite this key role, genetic resources are poorly known and above all there is no clear understanding of which ones are of greater importance, their value for the economy and ecological balance, and their conservation status, which should guarantee their use also for future generations.

A further threat to genetic diversity may be related to the uncontrolled presence of GMOs.

A high cost in terms of loss of biodiversity may indeed arise from the introduction of GMOs into farms and agricultural crops, those intended for human consumption and those intended for other purposes, due to the transfer of exogenous genes to other species by GMOs. With regard to any possible health effects, see the specific work area.

It is therefore necessary to assess the way GMOs are used so as to prevent our Country's biodiversity heritage from being eroded, an heritage which is significant even from an economic standpoint for the wide variety of typical Italian products exhibiting high genetic specificity.

Therefore, this work area deals with aspects relating to the knowledge, conservation and sustainable use of genetic resources in our Country as well as aspects relating to the use and trade of genetic resources coming from other Countries, especially developing ones.

According to the 2002 Summit on Sustainable Development in Johannesburg, the international community is negotiating an international regime aimed at regulating access to genetic resources, for example by signing agreements between supplier Countries and user Countries in order to achieve an equitable benefit sharing (ABS – Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization) which they and their products provide mankind.

Threats to genetic resources can be summarized as follows:

- species extinction and genetic erosion within species;
- genetic pollution, also due to the introduction and spread of alien species and GMOs.

The following specific objectives for this work area that are to be achieved by 2020 are:

1. achieving the third objective of the CBD, for the fair and equitable sharing of benefits derived from the use of genetic resources;
2. improving knowledge of the national and international heritage of genetic resources (nature, distribution and conservation status), the types of sustainable use, the analysis of their contribution to the national economy as well as the traditional knowledge associated with their use;

3. increasing awareness of the opportunities arising from the use of genetic resources and of the risks associated with genetic erosion and pollution through information, communication and awareness programs;
4. achieving the objectives of the European Plant Conservation Strategy (EPCS), European reference for the Global Strategy for Plant Conservation (GSPC) in terms of genetic plant resources;
5. increasing the contribution of in situ and ex situ conservation to maximize the protection and recovery of biodiversity, ecosystem services and the related economic benefits as well as to support climate change adaptation and mitigation;
6. protecting some ancestral species of crops and livestock at risk of extinction or genetic pollution;
7. preventing genetic pollution of wild animals in the herd of terrestrial and marine species and restocking activities;
8. mitigating genetic impacts of non-native species.

The following priority measures have been identified to achieve the above mentioned purposes:

a) participation in the negotiations of the International Regime on ABS;
b) adoption of the International Regime at a national level within the required timeframe;
c) dissemination to the sectors concerned (agricultural, industrial, commercial and conservation) of guidelines established within the International Regime on the correct use of animal and plant genetic resources, also with special reference to the Bonn Guidelines;
d) implementation of the National Biodiversity Plan of agricultural interest issued by the MiPAAF – Ministero per le Politiche Agricole Alimentari e Forestali (Italian Ministry of Agriculture, Food and Forestry Policies) in compliance with the guidelines of the Permanent Committee on Genetic Resources;
e) promotion of scientific and technological research relating to the national heritage of genetic resources (nature, distribution and conservation status), types of sustainable use, analysis of their contribution to the national economy as well as the traditional knowledge associated with their use;
f) creation of information campaigns aimed at increasing awareness among citizens and civil society, private organizations and public authorities of the potentials, opportunities and risks arising from the use of genetic resources;
g) harmonization and integration of acquired knowledge, while identifying critical issues and actions that need to be carried out under existing instruments regarding the use of genetic resources in the commercial, agricultural and forest fields, to conserve genetic diversity of species and ecosystems of national and local significance;
h) involvement of stakeholders through cooperation mechanisms having positive impacts on efforts to achieve CBD's third objective, at a national and local level, and leading to a better understanding of cross investments in biodiversity conservation;

i) acknowledgement and promotion of the role of botanical gardens and germplasm banks of cultivated and wild plant species as a contribution to the conservation of native plant species and landrace (conservation varieties) of our Country and as part of a national and international network aimed at conserving plant species (Global Strategy for Plant Conservation);
j) survey of existing Zoos and Aquariums at a national level and assessment of their efficiency and effectiveness for both in situ and ex situ conservation of animal species threatened by extinction also according to the recent "Building a Future for Wildlife: The World Zoo and Aquarium Conservation Strategy" (WAZA, 2009);
k) promotion of programs and measures for in situ and ex situ conservation of animal species at risk of extinction through the involvement of and in cooperation with zoos and aquariums;
l) establishment of a proper national network of forest biodiversity conservation centers provided for by Legislative Decree No. 227/2001, while strengthening and enhancing the existing National Centers as a matter of priority;
m) support to ethno-anthropological research to expand the traditional knowledge of the communities of the various Italian regions;
n) implementation of Legislative Decree No. 386/2003 to enforce Directive 1999/105/EC on the marketing of forest reproductive material.

Measures at an international and European level

[*omissis*]

Measures at a national level

In recent years, several activities have been carried out, at a national level, in the field of genetic resources and ABS, also in keeping with the requirements laid down by the CBD and the European Union.

In order to preserve the biological diversity of national forests, Article 10 of Legislative Decree No. 227 of May 18, 2001, recognized plants for forestry seeds in Pieve S. Stefano and Peri and the laboratory in Bosco Fontana as national centers for the study and conservation of forest biodiversity. In the same way, it called for the creation of a commission aimed at identifying additional plants that are sufficient in number and modality to represent homogenous areas, from an ecological standpoint, for forest biodiversity conservation.

Legislative Decree No. 386 of November 10, 2003 (transposition of Directive 1999/105/EC) concerning the marketing of forest reproductive material provided the definition of Regions of Origin (for one species or subspecies, it is the territory or set of territories subject

to sufficiently uniform ecological conditions on which autochthonous stands or seed sources are sufficiently homogeneous in terms of phenotype and, where evaluated, in terms of genotype, taking into account altitudinal boundaries, where appropriate) to learn about and better manage Italian forest genetic resources.

With regard to plant genetic resources for food and agriculture, Law No. 101/2004 ratifying the FAO Treaty on Plant Genetic Resources, established the competences of the Regions and Autonomous Provinces in terms of implementing and executing the Treaty and entrusted the MIPAAF with the task of reporting on the implementation of the Treaty and the monitoring of measures undertaken at an international level.

In December 2005, the Italian Network of Germplasm Banks (RIBES – non-profit association of social promotion) was founded for the ex situ conservation of Italian wild flora, which has been very active nationally, regionally and internationally, through the work of its members who are mostly universities, national and regional parks, regional and local authorities.

In 2008, the MiPAAF, along with the Regions and Autonomous Provinces, developed the National Plan for Agrobiodiversity: "*to coordinate the combination of initiatives and relations with national and international organisms involved in agricultural biodiversity. It is also to provide the Regions and Autonomous Provinces called upon to implement the FAO Treaty from law 101/2004 with concrete answers to the problems that have emerged in introducing a nation-wide system of agricultural biodiversity protection able to restore most of the biodiversity no longer present or at risk of extinction, to the benefit of environmental protection, sustainable agricultural and rural development. In so doing, the system will also be able to contribute to performing Italy's obligations in international treaties*."

The Plan is aimed at defining a common working method and approach to the protection of agricultural biodiversity of plants and animals, shared among all stakeholders in the private and public sectors and in the research field (the Agricultural Research Council, the National Research Council, universities and other public or private institutions) in order to harmonize the specific measures and ensure comparable results.

The PQSF - Programma Quadro per il Settore Forestale (Framework Program for the Forest Sector) approved by the "State-Region Conference" on December 18, 2008, considered the protection of ecological biodiversity in forest ecosystems and the enhancement of strategic initiatives aimed at safeguarding the in situ and ex situ forest genetic heritage as protection and conservation priorities.

Although Italy has not formally adopted a National Strategy for Plant Conservation, several activities related to the Objectives of the GSPC have been carried out. Italy also con-

tributes to Planta Europa, at a regional level; the latter, has recently produced, in cooperation with the Council of Europe, the document titled A Sustainable Future for Europe: the European Strategy for Plant Conservation 2008-2014 (UNEP/CBD/COP/9/INF / 31) as a regional contribution to GSPC.

The Global Strategy for Plant Conservation, adopted by the CBD in 2002, includes among its objectives (OB. 9) the conservation of 70% of the genetic diversity of cultivated plants and other plant species of greater socio-economic value and (OB. 8) the ex-situ conservation of 60% of endangered plant species, at least 10% of which are part of recovery and restoration programs.

In December 2009, ISPRA completed a report on the status of the ex situ conservation of plant biodiversity in Italy which illustrated the critical areas related to the different components of the flora (native wild species, forest and cultivated species) and identified priority measures to be implemented to solve the most urgent problems.

With regard to the conservation of plant species, there are a hundred Botanical Gardens in Italy which play a role in the preservation of native plant species. A summary of the plant collections displayed in these gardens is not available at present.

As for Zoos and Aquariums, the UIZA - *Unione Italiana Giardini Zoologici e Acquari* (Italian Union of Zoos and Aquaria) cultural association, groups together zoos and aquariums which have scientific and educational purposes and ensure good standards for animal care, promoting projects for species facing a high risk of extinction in and out of Italy.

4. Agriculture

The CBD defines agricultural biodiversity as "…all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes".

Agricultural biodiversity is a sub-set of general biodiversity and comprises the diversity of genetic resources, i.e., diversity of genes within animal, plant and microbial species, diversity of species, which refers to the number of species of plants, animals - livestock production and wildlife – diversity of microorganisms and diversity of ecosystems on Planet Earth.

The relationship between agriculture and biodiversity is extremely complex, at times controversial. Biodiversity of both wild and domestic, cultivated and reared species, is the cornerstone of agriculture as it provides for food production and makes an important contribution to the health and nutrition of the world's population. In the past, the same genetic resources have enabled an improvement of species, cultivated and reared, and will continue to perform this function in the future. This variability will also make it possible to deal with the evolving market for agricultural products and to adapt to climate and environmental changes.

Given this important role as repository of biodiversity, agriculture is recognized worldwide as the largest driver of genetic erosion, species loss and conversion of natural habitats. (Millennium Ecosystem Assessment 2005).

As a supplement to the dual role played by agriculture with regard to Italy's natural heritage, it should be mentioned that about 42% of the national territory is intended for agricultural activities (ISPRA, 2010), that part of it, approximately 21% of the Utilized Agricultural Area (UAA), is covered by High Natural Value (HNV) Farmland and Natura 2000 areas, in terms of biodiversity of genes, species and landscape, which also act as links between natural spaces. Italy, along with Spain, Greece, northern Great Britain and Scandinavia, preserves a high percentage of agricultural areas of significant natural value, such as Alpine meadows and pastures.

The intensification of agricultural activities, the structural simplification of natural ecosystems, the abandonment of rural areas, primarily in disadvantaged regions, also caused by the fact that their use is not cost effective, as well as the use of fertilizers and plant protection products are among the main threats to biodiversity related to agricultural habitats.

Furthermore, the functional integrity of farming is highly dependent on conditions that ensure the high efficiency of ecosystem services.

The latter, of direct benefit to humans, derive from an effective interaction between agricultural and wild ecosystems.

Agriculture requires the following:

- soils that, because of the diversity and abundance of the organisms living in them (soil biodiversity), have and maintain adequate fertility and resilience;
- greater attention to and increased awareness of planned and associated biodiversity in agricultural management;
- systems for preventing and combating pests and pathogens having low impact on other living organisms (biological, integrated or biodynamic);
- water supply for irrigation systems;
- the conspicuous presence of insect pollinators, for the crucial service they perform in fertilization (entomophilous pollination) and thus in the reproduction of most of the cultivated plants.

The role of agriculture for the protection and promotion of biodiversity is likely to be affected by the expansion of urban infrastructure and speculation related to the search for agricultural land destined for renewable energy facilities. Data produced by ISTAT – Istituto Nazionale di Statistica (National Institute of Statistics) show a decrease in the UAA from 1950 to 2000; the UAA in Italy has gone down by about 5 million hectares, 40% of which has become an unproductive wasteland; the unproductive area is currently estimated at 15% of the national territory with peaks of 30% across the peninsula.

The major problems faced by the agricultural sector in terms of biodiversity can be summarized as follows:

- general loss of biodiversity in all its aspects (diversity of the genes, species and agro-ecosystems), also taking into account the abandonment of traditional agricultural practices, native animal and plant species which are no longer considered profitable from an economic and technical standpoint and traditional landscape features such as dry stone walls, irrigation canals etc.
- soil erosion, decline of organic matter and soil biodiversity, and desertification;
- conflicts over decisions about land use linked to the increase of agricultural production resulting in the interruption of the environmental continuum and ecological connectivity;
- use of unsustainable farming practices;
- introduction of species for various reasons (biological pest control and integrated pest management, breed or variety improvement, increase in productivity, etc.) or other alien genetic material and subsequent hybridization of the strains, breeds and/or local varieties in addition to native species;
- pollution by chemicals used in regular farming practices (nitrogen and phosphorus fertilizers, plant protection products, cultivation of biomass for energy, etc.) or other

substances from atmospheric pollution sources or in agriculture from the use of animal manure, wastewater, sewage sludge, etc. (pharmacological facilities for animal husbandry and medicine, radionuclides, heavy metals, polycyclic aromatic hydrocarbons etc.);

- transfer of parasites or diseases from rural to wilderness areas;
- effects of climate changes, which may amplify regional differences and exacerbate economic disparities between rural areas;
- agricultural abandonment, especially in the Country's marginal hilly and mountain areas, as shown by a reduction in the UAA;
- homogenization of cultures with extensively cultivated varieties, geared to meet market demands, but which do not comply with the principles of sustainable agriculture.

Compared to other sectors of the world of production, agriculture offers practical and feasible opportunities to mitigate effects and adapt to climate changes through the implementation of carbon sequestration and to improve soil resilience which is due, for the most part, to the presence of a rich and diverse edaphic community.

Planting systems such as no-tillage aka sod seeding, i.e., seeding of a turf area, or more simply conservation agriculture, call for a reduction in the intensity and/or depth of cultivation practices; cover crops, catch crops (grass, green manure, etc.); crop rotation, intercropping and introduction of intercropping; preservation or creation of vegetated buffer strips or vegetative barriers such as hedges or trees; the adoption of biological and extensive farming techniques are considered positive in respect of agricultural productivity and for the protection of biodiversity and soil fertility.

It should be stressed that some of these techniques can, in some circumstances, go against the objectives of biodiversity conservation as in the case of the reduction of bare fallow or modification of land use for the production of biomass used as fuel.

Italian agriculture is also characterized by large areas dedicated to organic farming: a million hectares equal to nearly 3% of the world's surface area intended for biological farming and 12-13% of the biological UAA within the EU, making it one of the leading producers in the world in this field and the first in Europe along with Spain.

Agricultural policies and financial instruments for the management of agricultural resources play a decisive role in the management and conservation of biodiversity: the current CAP is also aimed at achieving objectives of environmental protection, social and economic promotion.

In this sense, the CAP plays an important role to promote long-lasting production models that are economically sustainable while allowing man to take action on the environment for

the enhancement of biodiversity and the restoration of the largest number of species of animals, plants and microbes.

In this context, the specific objectives to promote the conservation and sustainable use of agricultural biodiversity are the following:

1. promoting the conservation and sustainable use of agricultural biodiversity, the protection and dissemination of HNV agricultural and forestry systems;
2. maintaining and restoring, where necessary, ecosystem services of the agricultural environment that are being damaged due to the impact of chemicals, the loss of soil and soil biodiversity, the connectivity conservation and the pollution of air, soil and water;
3. promoting the protection of the territory (especially in marginal areas or areas that are subject to marginalization and abandonment) through integrated policies that promote sustainable agriculture with benefits for biodiversity, the conservation of hydrological balances and nutrients while avoiding the abandonment and/or marginalization of agricultural areas (application of conditionality meaning that farmers become the guardians of their lands);
4. promoting protection and enhancement of local and indigenous species;
5. implementing the records of the farmed species, so as to survey and monitor the extent of pure native populations;
6. promoting the use of lands according to their aptitude/functions and encouraging the protection and enhancement of local and indigenous species, even considering the need and opportunity to modify crops and varieties on the basis of climatic trends;
7. supporting the maintenance of ecosystems and the rural landscape through a focused management of agricultural land in order to create and/or maintain a kind of "green infrastructure".

The following priority measures are needed to achieve the above mentioned specific objectives:

a) promoting the spread of:
   i. farming practices aimed at reducing biodiversity loss, with special emphasis on the biology of the species (feeding, reproduction, migration) and habitat destruction;
   ii. eco-friendly farming practices, especially those used in organic agriculture aimed at reducing releases of pollutants into soil, surface water, groundwater and in the atmosphere, and increased organic matter and CO_2 absorption capacity of agricultural land, through the conservation of edaphic biodiversity;
   iii. practices aimed at diversifying production;
   iv. actions aimed at preventing possible risks associated with the introduction of genetically modified crops;
   v. actions aimed at marketing less hazardous chemicals and their sustainable use for reducing eco-toxicological risks associated with them (e.g., reproductive toxicity

and endocrine disruption) taking into account possible combined effects from multiple chemical exposures;

vi. activities aimed at protecting the rural landscape and its distinctive features also through an increase in the spread of wildlife, a reduction in landscape simplification and fragmentation of natural and semi-natural habitats;

vii. actions aimed at reducing, especially in ecologically vulnerable areas, the phenomenon of intensification and specialization of farming practices;

viii. soil protection measures through the adoption of farming systems in an effort to prevent the physical, chemical and biological degradation of the soil and waters;

ix. actions aimed at restoring defense techniques and at conserving soil and waters (ditches, hedges, trees and other typical agro-landscape features) as well as hydraulic agricultural techniques that are typical of each region (such as the ones called in Italian "rittochino", "cavalcapoggio" and "girapoggio");

x. the increase of changes and rotations and the agronomic management practices of the most conservative crops (tillage methods, catch crops, permanent pastures and extensive forms of agricultural production);

xi. land-use change and/or maintenance (conversion of cropland to pasture in marginal areas or temporary/permanent grasslands; conservation of permanent pastures and meadows in marginal and mountain areas);

xii. extensive farming in marginal areas (reduction in stocking density) and rational management of grassland;

xiii. implementation of a soil biodiversity monitoring program;

xiv. activities that promote the protection of existing populations of insect pollinators and repopulation or reintroduction of endangered or extinct species;

b) promoting the protection and management of agro-forest districts falling within the Natura 2000 network sites with special emphasis on the conservation measures, management plans and funding options set forth in the rural development programs;

c) promoting efforts to identify high nature value farmland, i.e., forest or agricultural areas characterized by the presence of species of conservation interest or with a great variety of species depending on farming and forestry (HNV-HNVF);

d) favoring:

i. diversity in agro-ecosystems;

ii. protection of the territory, especially in the agro-forest areas of high natural value and in disadvantaged areas;

iii. the environmental complexity of agricultural areas – especially large areas with intensive farming and alluvial zones – through the use of arboriculture and arboreal-shrub-herbaceous intercrops ensuring the presence of semi-natural habitats that are needed for the development of an adequate ecological network, in particular for the wild fauna, the "minor fauna" and for the species linked to perifluvial and aquatic habitats;

iv. soil pollution monitoring campaigns to be conducted in representative pilot areas – soil, environment, cultural systems (scenarios).

e) promoting:
    i. reduction in the use of synthetic chemicals, such as fertilizers and pesticides, in particular those at high risk;
    ii. protection and preservation of animal and plant genetic resources that are subject to genetic erosion;
    iii. preparation of the National Action Plan for the sustainable use of pesticides under Directive 128/2009/EC;
    iv. assessment, prevention and mitigation of impacts on biodiversity and on the ability to maintain the provision of ecosystem services in the production of biomass and biofuels (see Resolution No. 41/2009 of the Berne Convention);
f) ensuring an effective level of governance and partnership between different sectors and players to implement the CAP instruments aimed at protecting species and habitats of Community interest (Directives 79/409/EEC and 92/43/EEC);
g) implementing programs and initiatives aimed at promoting prevention and control activities and increasing awareness among stakeholders in the agricultural sector of biodiversity losses caused by the use of pesticides and of the opportunities arising from the use of integrated pest management in agriculture.

Measures at an international and European level

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Measures at a national level

The activities planned in connection with the rural development policy through the National Network program, operated by the MIPAAF Directorate General for Rural Development, and the recent review of the National Strategic Plan have identified biodiversity, climate change and the protection of the agricultural landscape as objectives that need to be strengthened in the 2007-2013 plan period.

The 2007-2013 Rural Development National Strategic Plan (NSP) provides a formal framework for the planning of agricultural and forestry measures; it is the reference strategic document intended to provide guidance in the integration process between agriculture and environment and in the implementation of the National Strategy for Biodiversity with regard to the Natura 2000 agricultural and forestry areas, high nature value areas and the protection of animal and plant genetic resources.

The preservation of biodiversity and the protection and dissemination of high nature value agro-forestry systems is indeed one of the objectives identified by the NSP under Axis 2 “Improving the environment and the countryside” of Council Regulation (EC) No. 698/2005.

The NSP has recommended actions for high nature value agro-forest areas, especially protected areas (including the Natura 2000 sites) and the disadvantaged areas in an effort to promote the following:

- preservation and enhancement of semi-natural habitats, including natural features, such as: hedges, rows of trees, grass strips, woodland and ponds;
- development of ecological corridors through the strengthening of the crucial points of the ecological network and a greater connectivity between protected areas through the preservation and dissemination of natural features (rows of plants, hedgerows and deciduous trees) and typical anthropogenic features (such as dry stone walls and small channels);
- restoration of natural habitats and the adoption of environment-friendly farming practices.

Particularly in protected areas, planning and management policies should be adopted across wide areas, so that the dynamics of ecosystems and their functional relationships can be taken into account and their management can be integrated into the management of the territory and ecosystems that are outside the protected areas. The development of appropriate measures will likely have a positive impact on several features of agricultural land, especially hedges and other typical linear features which increase habitat connectivity, as well as soil biodiversity, which guarantees soil resilience and other ecosystem services, including storage of CO2 in soil.

The National Rural Network program has great potential to support the implementation of the NSP and the RDP, because it calls for specific actions aimed at promoting the integration process between environment and agriculture. Among them are the interregional laboratories for development which are intended to meet the environmental challenges of rural development, the definition and implementation of suitable biodiversity indicators for monitoring and assessing agricultural policies and providing input during the review process of the same.
It is also worth highlighting the following:

- identification of high nature value farmland, i.e., agricultural or forest areas that are characterized by the presence of species of conservation concern or that have a high species richness that depend on farming and forestry;
- identification and characterization of high nature value agricultural and forestry systems, i.e., systems on which high biodiversity depends;
- analysis of the trends of farmland and forest bird species at a regional level and the calculation of the Farmland Bird Index and the Woodland Bird Index at a regional and national level, according to a multi-year program.

Pursuant to DM of July 29, 2009, to Council Regulation (EC) No. 73/2009, the MIPAAF has elected to adopt measures aimed at improving the management of arable land in the agricultural areas of Central and Southern Italy, leading to better agro-environmental condi-

tions of arable land where the sowing of autumn and winter cereals can be repeated over several years on the same land surface.

The Department of Rural Development of the MIPAAF has set up a National Plan on Agricultural Biodiversity (NPAB) which is another valuable resource for coordinating national policies aimed at promoting the conservation of genetic resources of agricultural interest.

The NPAB has called for the establishment of the Committee on Genetic Resources which was activated in 2009 and is still working to implement the plan.

Moreover, the efforts of the Ministry are all aimed at achieving sustainable agricultural and forest development through other plans or programs in the sector or resources derived from specific projects.

Legislative Decree No. 152/06 - Environment Regulation – and subsequent amendments and additions, stated that the District Basin Management Plan, which provides guidelines, regulations and technical and operational information, allows activities and terms of use to be planned in order to achieve the conservation, protection and enhancement of the soil and to ensure a correct use of waters, based on the physical and environmental characteristics of the land. This plan also includes measures to counter the effects of subsidence and desertification, also through programs and actions aimed at ensuring greater availability of water resources and the reuse of the same. Article 65, paragraph 3 letter o, Article 93.

While identifying priority areas for action, Comitato Interministeriale per la Programmazione Economica (CIPE) (Interministerial Committee for Economic Planning) Resolution No. 229/99 - National Program to Combat Drought and Desertification (PAN) defines measures to combat desertification and requires that specific actions be carried out regarding the following:

- land management that takes into account the characteristics and special vocation of the land for agricultural and non-agricultural activities;
- limiting agricultural land covered by crops in a protected environment;
- extensification of crops recording excess supply;
- incentive measures for promoting the cultivation of species according to the function of the environment (climate, soil, topography) with maximum energy eco-efficiency and minimum chemical support;
- adoption of farming systems compatible with the environment;
- implementation of strategies to achieve truly sustainable agriculture, capable of planning crops and rationalization of irrigation activities;
- adoption of codes of good agricultural, animal husbandry and agro-forestry practices.

Council Directive 1999/105/EC, transposed into Legislative Decree 386/2003, introduced regulations on seed collection, nursery production, marketing and "traceability" of the

FRM (forest reproductive material), a term that indicates forest fruits and seeds, seedlings or plants from natural regeneration, rooted cuttings, striplings, grafted plants and in vitro-cultured plants of a large number of species, both trees and shrubs, used for "forestry purposes". According to Legislative Decree 386/2003, the competent Regional authorities that are responsible for managing local forest resources, are called upon to fully and effectively enforce the rule and thus, Directive 1999/105/EC. The Regions also define the regions of origin, the areas for the collection of FRM, and their registration in the Regional Book of the Seed Woods.

5. Forests

Italian forests are characterized by a high species diversity, (physiognomic, structural and landscape diversity), increased by our Country's environmental heterogeneity (biogeographical, bioclimatic, litho geomorphological and pedological heterogeneity). Overall, Italian forests are among the richest in Europe, with their 117 different arboreal species (2/3 of the European floristic heritage). At the same time, as many as 10 of the 14 forest categories considered most representative of the forest ecological variability of Europe (EEA, 2006) are present in our Country. In addition to this diversity of forest communities, there is also a rich variety of flora and fauna.

According to INFC 2005 - Inventario Nazionale delle Foreste e dei Serbatoi Forestali del Carbonio (National Inventory of Forests and Forest Carbon Sinks), the Italian forest area is estimated at 10,673,589 hectares, equal to 34.7% of the national territory. Considering the decline in agricultural and pastoral areas (from 1992 to 2002 the UAA decreased by 10.8%), the estimated surface area is gradually increasing. Data collected by ISTAT show that the Italian forest area increased from 5.6 million hectares in 1950 to 6.8 million hectares in 2005. The growth rate was quite fast in the early decades, but recently the area has remained virtually unchanged for most of the regional districts that were the subject of the survey. Notwithstanding the different methods of survey and monitoring, the main reason for the discrepancy in the details prepared by ISTAT and INFC regarding the extent of forest area lies in the fact that according to ISTAT, only groups that have a coverage degree of more than 50% belong to the "forest" class.

It should not be forgotten that forests in Italy as well as in all other Southern European Countries are ecosystems whose natural complexity has been modified by human activity since the Neolithic period.

Most Italian forests are represented by systems that are simplified from a structural point of view (e.g., coppices, high forests with native species having a simplified structure and/or composition, artificial populations of native species) with reduced variability in age and successional stages. Forestry and forest management have led to changes in the profile and chronological structure of the stands, in the soil biodiversity, in the presence of tree deadwood and in the interruption of coverage.

Although they were used in the past, forest patches that have developed signs of old age due to a sufficiently long absence of human disturbance are very rare and little known. They are considered hot spots for biodiversity conservation, as they ensure a suitable habitat for the preservation of rich and diverse edaphic communities. Even urban forests, while representing a small percentage of Italian forest cover, are unique reservoirs of biodiversity of flora and fauna. At the same time, the forests associated with agricultural crops (agro-forests) in the specificity

of their role, are natural niches of particular value in terms of conservation of biological diversity.

The protection of European forests is currently focused on the SFM (Sustainable Forest Management) and the potential impact that unsustainable management would have on forest biodiversity.
These aspects were discussed during the various Ministerial Conferences on the Protection of Forests in Europe (MCPFE and EFE / PEBLDS 2004). The SFM is defined as "the proper stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at a local, national, and global level, and that does not cause damage to other ecosystems" (Helsinki, 1993).

In addition to the production of wood and other forest by-products, forests provide a variety of essential ecosystem services: they represent major reservoirs of carbon and play a vital role in global climate regulation by contributing to the health of our Country and reducing greenhouse gas emissions. Moreover, forests make a significant contribution to renewable energy production by providing large quantities of biomass. The multiple functions of the forests show the relevant services that they can offer, thereby making the term 'multi-functionality' explicit.

In Italy, as in other Mediterranean countries, fires are currently a major threat to many forests and the biodiversity therein; almost all of them are attributed to human sources such as arson and may be the result of growing forest management abandonment and climate change. According to experts, the average temperature increase and the decrease in precipitation, especially in the summer, are likely to increase the frequency and severity of the phenomenon. The consequence is undisputed environmental damage which is reflected in the loss of soil biodiversity, a decrease in resilience, and the loss of most of the ecosystem services provided by forests. The above confirms that fires still pose the most serious threat to Italian forests, also due to ongoing climate change, with about 9,200 fires per year and an average of 100,000 hectares of land damaged or destroyed, about half of which is covered by wooded areas.

Considering that Italy is one of the most important consumer and processor of forest resources coming from other countries (wood, pulp and paper), it seems appropriate to make the market responsible for the impact of illegal trade of forest resources outside international borders (FLEGT - Forest Law Enforcement, Governance and Trade).

The main critical areas regarding knowledge, management and operations related to forest biodiversity conservation in Italy can be summarized as follows:

- the increasing number of fires that cause critical situations, made worse by the abandonment of about half of the Italian forests and by the effects of climate change;

- the increase in systemic fungal plant diseases and insect infestations;
- the expansion of urbanized areas and infrastructures resulting in the phenomena of fragmentation, isolation and increased vulnerability of certain types of forest habitats, especially coastal, riparian and lowland forest habitats;
- the expansion of some types of forest invasive alien species (Robinia pseudo-acacia, Ailanthus altissima and Prunus serotina) at the expense of natural forests;
- the progressive marginalization and cultural abandonment of the management systems of forests, landscape, environment and culture;
- the reduced effectiveness of the forestry component with regard to flood control leading to hydro-geological instability (landslides, floods, etc.);
- the difficulty in enhancing non-monetary services provided by forest resources, i.e., the positive external factors for the community: ecosystem, hydro-geological and landscape conservation, carbon capture and storage, aesthetic and recreational services, preservation of local short supply economy, etc.);
- the lack of an unequivocal monitoring program of forest biodiversity, including forest soil biodiversity;
- the lack of acknowledgement of the role played by trees outside forests in conserving biodiversity in agricultural landscapes;
- the lack of synergy between forest planning tools, rural development programs and urban, river basin and landscape planning instruments and the need for a reduction of the impact of territorial transformation processes on the ecological function of forest ecosystems at the level of landscape, habitat, species and genetic resources;
- the insufficient integration of biodiversity issues into forest ecosystem planning and management practices;
- the lack of integrated forest and wildlife management, with particular reference to ungulates, especially in the complex Mediterranean environment;
- the implementation of rational grazing methods while taking into account the importance of the sustainable load, to maintain clearings, thus counteracting the phenomenon of closing or reducing mountain clearings which is difficult to address in ways that have little impact;
- the reduced propensity of the forest sector to cultural, management and production adjustments and the very limited dissemination of types of joint management;
- the lack of planning and management instruments provided by the competent authorities.

The following specific objectives, to be achieved by 2020, have been identified according to critical areas:

1. seizing any support opportunity offered by the forestry measures set forth in the Rural Development Plans, with particular reference to environmental and forestry measures and to the Natura 2000 indemnities;

2. safeguarding the territorial integrity, the surface, the structure and the state of health of national forests by implementing the principles of sustainable forest management and ensuring a continuous monitoring process of the state of conservation of forests that can detect any problems early;
3. protecting landscape and biological diversity and complexity of forest ecosystems, enhancing their ecological connectivity, also through reforestation carried out in compliance with modern standards while preserving genetic diversity in terms of selection criteria for forest reproductive material; implementing measures aimed at adopting forest production systems that can prevent physical, chemical and biological degradation of forest soils;
4. mitigating climate change by improving the contribution of forest environments to the carbon cycle and implementing synergies between existing measures;
5. promoting the restoration and maintenance of ecosystem services of forests with particular reference to hydro-geological defence, flood control and efforts to maintain their quantity and quality;
6. restoring forestry potential damaged by weather events, plant diseases and fires by replacing it with native species even if they are not fast-growing;
7. promoting the effectiveness and harmonization of monitoring activities and data collection systems at a regional, national and European level, so that results can be brought together and compared;
8. developing appropriate levels of integrated planning between agroforestry, environmental, river basin, urban and infrastructural sectors;
9. promoting integrated forest and wildlife management, keeping in mind that wildlife is an essential component of forest ecosystems;
10. promoting and supporting rational types of grazing, while taking into account the sustainable load, to ensure harmony between interacting economic, social and biological processes for forest conservation purposes;
11. promoting interdisciplinary research projects that evaluate the multifunctional aspects of the sustainable *management* of forest systems, to maintain a high level of biodiversity, to better understand the impact of climate change, to counter the degradation of forest ecosystems and to promote the welfare of local communities;
12. raising awareness among people and authorities at various levels of the need to enhance non-monetary services offered by forest resources using the most appropriate communication tools;
13. promoting cooperation with countries that have important commercial relations with Italy in the area of forest products trade by promoting the sustainable management of their forest area
14. increasing the forest certification process, with particular reference to two bodies that are present in Italy: the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC).

The following priority measures have been identified by specific objectives:

a) fully implementing the provisions of the PQSF – Programma Quadro per il Settore Forestale (Framework Program for the Forest Sector) also through the activities of the "Forest Coordination Group" by introducing the guidelines and actions identified and the most effective governance and best practices processes, with particular reference to biodiversity issues;

b) promoting the integration of biodiversity conservation at all levels of forest planning, with particular reference to management plans for protected areas and conservation measures and management plans for Natura 2000 sites with a strong component of forest habitats;

c) making full use of the programs and instruments aimed at tackling climate change and improving the status of forest biodiversity as well as the socio-economic well-being, such as the LIFE+ regulation, RDP 2007/2013 forestry measures, the National Rural Network funds and the National Fire Fighting funds;

d) implementing measures to monitor and coordinate activities between the various administrations, based on existing inventory systems, such as the INFC, to support the development of actions for forest biodiversity conservation (e.g., monitoring the status of forest habitats, based on the Habitats Directive, identification and protection of ancient woodlands, measures for limiting invasive alien forest species) by 2015;

e) using the National Register of Agro-Forestry Carbon Tanks as a basic inventory system of our Country's forest resources to be updated continuously and provided with new functions specifically dedicated to the monitoring of forest biodiversity, as well as a tool to assess how much the Italian agroforestry systems can contribute to the absorption of greenhouse gas emissions;

f) promoting full implementation of Law 353/2000 through the development of forest fire control plans, in particular in protected areas of all types;

g) putting in place programs for environment-friendly purchases, types of partnerships to promote public-private cooperation and green purchasing by the public administration;

h) implementing international agreements on illegal timber imports (FLEGT), Due Diligence, etc..;

i) enhancing the role of tracking system based certification (FSC – Forest Stewardship Council, PFCS);

j) promoting the inclusion in the CITES Annexes of forest flora species that are strongly impacted upon by the market in order to ensure their proper management.

Measures at an international and European level

[*omissis*]

Measures at a national level

Legislative Decree No. 227 of May 18, 2001 has taken up a general regulatory significance which recognizes the critical need to link forest policy to be implemented at a national level to the commitments made by our Country at an EU and international level, with particular reference to the concept of SFM. This rule somehow fills the gaps in the existing legislation, by introducing a suitable connection between the laws of the sector and those of the environmental landscape sector, while recognizing the importance of forestry in the active conservation of forest resources and setting principles assigning the Regions the power of establishing rules governing forestry activities and providing the legal definition of forest.

Pursuant to Art. No. 3 of Legislative Decree No. 227/01, the "Guidelines on Forests" (June 16, 2005 DM) have been put in place in which, to support the Regions and the Autonomous Provinces, the conservation, preservation, enhancement and development of the forestry sector were identified, taking into account ecological, social and economic components and in compliance with international commitments entered into by our Country, while identifying the following priorities: environmental protection, strengthening of the competitiveness of the forest-wood chain; improvement of social and economic conditions of people working in the field and promotion of scientific research.

The PQSF – Programma Quadro per il Settore Forestale (Framework Program for the Forest Sector), prepared in compliance with Law No. 296/2006, while respecting institutional competences, meets EU (specifically, it is based on six criteria of the SFM arising from the MPCFE) and international commitments and supports the Regions in planning activities and issuing laws regarding the conservation, preservation, enhancement and development of the forestry sector.

The PQSF identifies four priority objectives to be achieved within 10 years (2009-2019), including land and environment protection by preserving and improving the protective function of forests; maximizing the capacity for carbon fixation; the preservation of the integrity and health of forest ecosystems, conservation of biodiversity and landscape diversity. The significance of the latter aspect is highlighted in the PQSF: among the various actions included in the PQSF, reference is made to the maintenance of forests under optimal conditions both from a structural point of view (by promoting flora diversity and biomass increase) and a func-

tional one (by maintaining and/or restoring their state of conservation and renewal capacity and checking forest conditions).

Even after the Health Check review, the NSP, i.e., the reference instrument derived from the reform of the European CAP, and the resulting RDP, call special attention to the forestry component and measures that can be financed. This is confirmed by the fact that two thematic papers providing technical support to the first draft of the NSP are, in fact, about forests: "Forests and Climate Change", "Biodiversity and Landscape".

The MiPAAF issued Legislative Decree of January 21, 2010 titled "Minimum criteria relating to good forestry practices" to enforce the measure called "forest-environment payments"; such payments are made per hectare of forest to beneficiaries who make forest-environment commitments that go beyond mandatory requirements. The forest-environment support is meant to compensate voluntary commitments aimed at improving biodiversity, mitigating climate change, conserving high value forest ecosystems, consolidating the productive and protective function of forests with regard to soil erosion, hydrogeology, water quality and natural disasters.

The fight against forest degradation and deforestation on a global scale highlights the need for action in terms of governance, coordination and integration of efforts by stakeholders, at a national and international level. In this perspective, three priority action areas can be identified for our Country which are absolutely complementary:

1. Transposition and implementation of decisions taken on a supranational scale and intergovernmental agreements on the subject, programs that, in many cases, are based on legally binding agreements with countries, but especially on soft law, on generic and non-binding commitments from a legal standpoint. One of the most important initiatives is certainly the EU Action Plan for Forest Law Enforcement, Governance and Trade and Commission Regulations No. 2173 and 1024 of December 2005 and October 2008. In particular, an area for action that appears as a priority in this context is the ability to promote voluntary cooperation agreements (Voluntary Partnership Agreements, VPA) with one or more timber-producing trading partner countries.
2. Moreover, mention should be made of the most recent proposal for a Regulation of the European Parliament and of the Council (EC, 2008), the so-called Due Diligence, which should be approved during 2010. To prevent unlawful conduct, the Due Diligence Regulation lays down the obligations of operators who place timber and timber products on the market in an effort to minimize the risk that timber products marketed within the EU have been illegally harvested and that the same forests from which the timber comes have been illegally managed.

6. Inland waters

Freshwater ecosystems cover only 0.8% of the Earth's surface but contain 10% of all animal species, including more than 35% of vertebrates.

They are the most exploited natural resource: the impact of continuous and intense human pressure, in particular the pollution resulting from production activities and the increased levels of collection and exploitation obtained through new concessions, are undoubtedly significant, and have negative effects on the related ecosystem services.

Land use is an additional factor of pressure on aquatic systems, since, by changing the physical properties of the outflow and, in general, the hydraulic circulation in various environments, some changes occur in the related physical, chemical and biological processes.

The unsustainable management of water resources, the increase in demand and the alteration of the hydrological regime caused by climate change but especially by the irrational use of water resources, are leading to the reduction and deterioration of water resources and the collapse of aquatic ecosystems, so much so that freshwater species appear to be most at risk of extinction with rates about six times higher than those for terrestrial or marine species.

This is a worrying trend because the aquatic biotic communities that support all life-cycle and production processes, provide a huge number of different ecosystem services, more than any other type of ecosystem. Their being altered will put billions of people at risk given that biodiversity loss in inland waters will have an impact on water treatment processes, on the spread of diseases, on agriculture and on fisheries. Moreover, since freshwater ecosystems absorb and capture nearly 7% of the carbon released annually into the atmosphere, even local carbon budgets will suffer significantly from the effects.

The main threats to freshwater biodiversity and related ecosystem services can be summarized as follows:

- physical and morphological alterations due to river channeling, the construction of water infrastructures, dams and dykes, dredging operations, soil use change and urbanization of perifluvial and lake areas;
- habitat loss and degradation due to population growth rate and increasing use of water resources:
- unsustainable use of water resources with a growing and uncontrolled withdrawal of freshwater for human use and production activities (agriculture, industry, hydropower, aquaculture, etc.)
- pollution due to excessive loading of pollutants and nutrients;
- accidental or intentional introduction of invasive alien species in aquaculture or for biological control causing competition for native species, alteration of nutrient cycles and productivity and loss of genetic integrity;

- impact of climate change affecting the entire hydrological cycle with obvious consequences on coastland wetlands, including sea level rise, increase in salinity, changes in water regimes and sediment transportation.

The following specific objectives have been identified and are to be achieved by 2020:

1. protecting and preserving freshwater ecosystems in the whole catchment area, tackling biodiversity loss and degradation and, where possible, promoting its restoration, to ensure the viability, function and production of ecosystem services, mainly for food and water supply but also for their capacity to mitigate climate change impact;
2. ensuring the integration of biodiversity conservation of freshwater ecosystems and related services into economic and sector policies, while improving public understanding of their benefits and the costs associated with their loss;
3. ensuring the sustainable use of water systems (water, sediments and biota), through integrated planning that includes the harmonization of competing uses, associated with several human activities related to inland waters;
4. improving knowledge of the overall status of aquatic systems, to understand the effects of human activities and climate change on physical systems and related biological processes;
5. curbing human pressure on inland waters exerted by the seasonal demand from tourism also through seasonality reduction and changing ways of tourism.

Based on the analysis of the main threats to freshwater biodiversity and the objectives of this work area, the following priorities for action have been identified:

a) ensuring by 2015 the achievement and maintenance of "good" ecological status for surface water and groundwater or, if already existing, the "high" quality status, according to the Water Framework Directive (WFD) 2000/60/EC and the national transposition legislation;
b) ensuring the full implementation of the Basin District Plans and water protection Plans;
c) strengthening the protection of aquatic ecosystems, by developing the necessary synergies between the requirements of the WFD and the Habitats and Birds Directives, as suggested by the joint plan of the CBD and Ramsar (River Basin Initiative - COP V of CBD - Decision V/II, May 2000) and within the WFD common Implementation Strategy (CIS - Work Program 2010 -2012) which is currently under study;
d) substantially reducing the impacts on aquatic ecosystems by reducing the impact of point sources of pollution (municipal wastewater, industrial wastewater and waste treatment), and diffuse sources (e.g., agriculture) and the effects of air pollution;
e) enhancing the cognitive activity in the field of water protection, through the optimization of networks for meteorological, hydrometric and freatic groundwater monitoring, not only for the management of the hydro-geological, hydraulic and drought risk but also to assess the availability of groundwater and surface water resources; the cognitive activity should also be extended to the pressure on resources (e.g., withdrawals, restitutions, etc..) in order to estimate water balance;

f) improving the use of water resources, through regulating activities and procedures based on the water concession system and control of illegal collection and of leakage due to the malfunctioning of the distribution network, assessing, on the basis of a cost/benefit analysis, the resource that based on basins, may be used without damaging ecosystem services;
g) supporting actions aimed at improving the efficiency of water resources to be used for productive activities and the reuse of purified wastewater for compatible use in all areas, by promoting water conservation and projects for the development of best practice water treatment technology and reducing abundant natural pollutants;
h) reducing the number of measures to modify river process management and alter watercourses, restoring connections between water bodies and related ecosystems as much as possible in order to promote migratory fish species and species that use water bodies and related habitats for their regular movements;
i) providing more information on the value of water resources, the right of access and the need to save water;
j) promoting the conservation of high value water bodies, through the recovery of wetlands, the restoration of river meanders, and the maintenance of semi-natural water bodies;
k) promoting the proper planning of irrigation projects, with special emphasis on the typical Mediterranean productions;
l) banning the introduction of invasive alien species in water bodies (e.g., in fisheries for restocking purposes);
m) supporting recreational and sport fisheries, in particular fishing tourism, promoting its recreational and cultural purposes as well as the correct use of aquatic ecosystems and fisheries resources, for example by creating interregional networks of dedicated sites.

Measures at an international and European level

[*omissis*]

Measures at a national level

In 1994, Italy signed the UN Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa (UNCCD), ratified later by Law No. 170 of June 4, 1997.

Resolution 229/99 issued by the Inter-Ministerial Committee for Economic Planning (CIPE) titled "National Plan to Combat Drought and Desertification" identifies possible water resource management measures, some of which have already been implemented.

In 2005, the MATTM funded the establishment of Programmi di Azione Locale di Lotta alla Siccità e Desertificazione (PAL) (Local Action Programs to Combat Drought and Desertification) in seven Italian Regions: Sicily, Sardinia, Apulia, Basilicata, Calabria, Abruzzo and

Piedmont). Subsequently, these programs have been developed for a second group of regions consisting of Campania, Emilia-Romagna, Liguria and Tuscany.

Italy has transposed the WFD through the third part of Legislative Decree 152/2006 and subsequent amendments which, by consolidating the existing legislation in a single text, has become the reference regulation for the protection of waters against pollution and water management, soil conservation and combating desertification.

As part of the implementing rules of Legislative Decree No. 152/06 and subsequent amendments, the following four decrees have been recently issued:

- DM No. 131 of June 16, 2008, entitled "Regulation on technical criteria for the characterization of water bodies (typing, analysis of pressure) and the amendment of the technical rules pursuant to Legislative Decree No. 152 of April 3, 2006, entitled: "Environmental Rules", prepared in compliance with Article 75, paragraph 4, of the same Decree";
- DM No. 65 of April 14, 2009, entitled "Regulation on «Technical criteria for the monitoring of water bodies and the identification of reference conditions for the amendment of the technical rules of Legislative Decree No. 152 of April 3, 2006 on Environmental Rules, prepared in compliance with Article 75, paragraph 3, of the same Decree»".
- DM No. 30 of March 16, 2009, entitled "Implementation of Directive 2006/118/EC on the protection of groundwater against pollution and deterioration".
- Decree of July 17, 2009 "Territorial information gathering and methods for collecting, exchanging and using data for the preparation of reports on the implementation of EU and national obligations regarding water."

The following are some of the innovations arising from Legislative Decree 152/06: systems of classification of water bodies, methods for defining environmental objectives, introduction of WFD monitoring requirements, organization and management of catchment/river basin districts, changes to the planning system through the introduction of the operational instrument of the Basin District Plans, custody and management of the integrated water system and introduction of new principles and new technical management structures.

Legislative Decree No. 152/2006 has identified 8 river basin districts across the nation and, by transposing Article 13 of the WFD, has established the legal requirement to draw up the related Management Plans Districts (Article 117).

The management plan is the means through which water policies can be drawn up over the next few years, by consolidating the actions required by directives in other areas and sectors (e.g., agriculture, urban waste water treatment, protected areas, etc.) in a single instrument; it contains a summarized cognitive framework of the physical characteristics of the district and the pressures and impacts exerted on it, the precise definition of environmental objectives and

any possible exception, the programs of measures and the economic aspects. It is developed through the activation of state controlled mechanisms and requires the timely evaluation of the technical and financial viability of the choices made, also through the use of specific tools, such as the economic analysis, the cost-benefit analysis and the cost-effectiveness analysis.

The essence of the management plan is the program of measures, i.e., the structural and non-structural actions aimed at achieving the conservation and restoration of water bodies in order to attain the environmental goals set by the Directive. The program of measures must be designed in a way so as to integrate all aspects of water protection, taking into account the characteristics of the river basin district, the impact of human activity on the status of surface water and groundwater, and the economic analysis of water use. The program consists of "core measures" and "additional measures". Core measures are the basic minimum requirements of the program which include all actions required to implement the Community legislation (including the Habitats and Birds Directives) and qualitative and quantitative measures to protect surface water and groundwater from any type of direct or indirect impact. Additional measures are provisions designed and implemented to complement the basic measures, with the aim of achieving the objectives set by Article 4 of the Directive.

Law No. 13 of February 28, 2009, has assigned specific coordination tasks to the National Basin Authority to ensure that, by December 22, 2009, the Authority and the Regions, whose territory lies in the river basin district, have drawn up the district management plans.

The Basin Authorities are organizations that carry out planning and scheduling activities for the whole catchment area, physiographic units where water cycle problems take place and on which the human system interacts, through the transformation of the territory, adjustment works and drainage systems, water collection and drawing, the release of pollutants and more.

The sustainable use of water systems must be guaranteed in the district management plans through integrated planning that should require the harmonization of competing uses or the improvement of knowledge of the overall status of aquatic systems, aimed at achieving an understanding of the effects arising from the impacts of human activities and climate change on physical systems and biological processes associated with it. In particular, it is worth mentioning that among the various priorities for action is the achievement of the WFD objectives and the full implementation of the district water management plans, the rationalization of water resource uses, based on cognitive studies at the basin level, the reduction of drainage system measures and the hydro-morphological alteration of watercourses.

The current planning instruments contain management criteria for actions taken in connection with the sustainable management of land and water resources, from a qualitative and quantitative standpoint, the establishment of the minimum vital flow, as well as measures and policies for limiting floods and landslides; moreover, the measures set forth by the Management Plan also call for specific guidance on biodiversity and protected areas; it is worth noting that the program of measures envisaged in the Directive is also attained through an evaluation of economic uses and actions: the economic analysis is used as a tool to justify the measures

taken to ensure that the same are functional and can lead to the achievement of environmental objectives, that are economically sustainable and thus, feasible.

Law-Decree No. 194 of December 30, 2009, Article 8, has established an extension, in environmental terms, by deferring the deadline for the adoption of the management Plans to February 28, 2010, in compliance with Article. 13 of the WFD.

By virtue of such extension, on Feb. 24, 2010, pursuant to Art. 1, paragraph 3 bis of Legislative Decree No. 208 of December 30, 2008, converted into Law No. 13 of February 27, 2009, with amendments, the Institutional Committees of the Basin Authorities of national significance, integrated by members appointed by the Regions whose territorial area falls within the river basin district to which the plan refers and that are not represented in the Committees, have adopted management plans as set forth in Article 13 of the WFD. With regard to the river basin districts of Sicily and Sardinia, the management plans were adopted at a regional level on March 18 and February 25, 2010 respectively.

The management plans were drawn up in the manner set forth in Article 14 of the WFD, to ensure the involvement of stakeholders and citizens in the development process and were subject to public consultation for six months.

The management plans adopted after completing the SEA procedure, were sent to the European Commission in compliance with Community obligations by March 22, 2010.

They are available for consultation on the MATTM web portal that is dedicated to the implementation of the WFD (http://www.direttivaacque.minambiente.it/), and in the web sites set up by the national river basin authorities and the Regions of Sicily and Sardinia.

7. Marine environment

Italy is one of the richest countries in Europe and the Mediterranean in terms of marine biodiversity; of the 8,750 species listed in the checklist, 10% are known exclusively for the Italian seas and of the 10 species of Cetaceans that are present with populations in the Mediterranean Sea, 8 of them can be seen regularly in Italian waters.

According to the Dossier on the State of health of Mediterranean coasts drawn up by UNEP/MAP, the population in the Mediterranean coastal cities will increase from 70 million in 2000 to 90 million by 2025. The linear density is three times higher than in the last half century. It rose, in fact, from 580 persons per km of coastline in 1950, to 1530 in 2000 and is expected to reach 1970 in 2025.

The number of coastal cities has almost doubled since the last half century, from 318 in 1950 to 584 in 1995; with its 196 municipalities located along 8000 km of coastline, Italy alone covers almost one third of all urbanized areas present in the Mediterranean.

In addition to the population growth, tourism flows should also be mentioned: in twenty years, 312 million tourists will decide to spend the summer along the coast. There will be 137 million more in just 25 years that should be added to the 175 in 2000, which will cause damage. A study conducted in the Balearic Islands shows that a tourist produces an average of 50% of solid waste more than a resident and drinking water consumption increases by 45%.

The man-made production and development are therefore concentrated along the coasts. The Plan Bleu drawn up by UNEP/MAP recorded 2300 of artificially built areas along the Mediterranean in the year 2000. In essence, there is one every 20 km and the list includes, in addition to the 584 cities already mentioned, 750 marinas, 286 commercial ports, 13 gas plants, 55 refineries, 180 thermal power stations, 112 airports and 238 seawater desalination systems.

The effects of this development, if uncontrolled, could lead to the destruction of habitats, the contamination by dangerous substances and nutrients and the worsening of climate change effects, resulting in biodiversity loss or degradation.

Marine ecosystems, already under pressure from pollution and overfishing, are subject to the effects of temperature increase and acidification, caused by climate change associated with increased carbon dioxide levels, resulting in changes at the level of reproduction and abundance of species, the distribution of marine organisms and plankton community composition.

Because of the additional pressure that these changes exert on marine ecosystems there is an even more urgent need to reduce fishing pressure to sustainable levels. Overfishing, which has made marine ecosystems more vulnerable to climate change and least able to adapt, must be replaced by sustainable fishing.

Despite the fact that marine ecosystems in European waters are required to allow a high fish stock productivity, most of them are depleted due to overfishing. 88% of EU fish stocks are subject to a fishing pressure that exceeds the level of maximum sustainable yield (MSY); this means that these stocks could quickly collapse, with extremely negative consequences on the marine ecosystem and the market. 30% of them are in fact below safe biological limits and at risk of not being able to reproduce.

Most of the European fishing fleets operate at a loss or with a minimum economic return, and only a small part of them make a profit without the need for public funding.

The economic and social sustainability of fisheries cannot ignore the existence of productive fish stocks and healthy marine ecosystems. Only by restoring and maintaining long-term productivity of the stocks can the economic and social viability of the fisheries sector be preserved. In the long term, therefore, there is no incompatibility between ecological, economic and social objectives. According to the MSY principle, the management of fish stocks will offer a better future for the European fishing community and ensure its contribution to food security in Europe. This objective must be achieved by 2015, in line with the commitments made at an international level. In the short term, however, a conflict between these goals may arise, especially when there is a need to temporarily reduce fishing, subject to overexploitation, to allow stocks to reproduce. In many cases, employment support and other social goals have been pursued to justify higher short-term fishing opportunities, which further compromises the state of stocks and the future of fishermen who draw sustenance from them.

It is therefore essential that any compromises made to cushion the economic and social effects of reductions in fishing opportunities remain compatible with long-term ecological sustainability, in particular through the adoption of exploitation patterns so that the maximum sustainable yield can be determined and the following goals can be achieved: elimination of discards, reduction of environmental impact of fishing, introduction of rules regulating its intensity and quality over time (for example, rules on the selectivity of fishing nets and waste reduction which are important for resource management and thus for the economic impact).

The European Commission will make future efforts to ensure that the Common Fisheries Policy reflects the ecosystem-based approach as indicated in the Strategy for the Marine Environment and will strive to eliminate illegal, unreported and unregulated fishing in European waters and high seas.

Modern aquaculture, which represents a major innovation in the production of fish and aquatic food, has been the fastest growing food production sector with an average worldwide growth rate of 6-8% a year.

It currently provides about half of the world fish supply for human consumption and has a significant potential for further growth. It is therefore a key part of the solution to meet future demand for fish although it cannot reduce the pressure caused by the overfishing of wild stocks.

The development of aquaculture, however, must be achieved within a regulatory framework that encourages entrepreneurship and innovation, ensures compliance with strict

environmental and public health regulations and is compatible with a high level of protection of natural environment. Aquaculture, in turn, requires top quality water to guarantee the health of aquatic animals as well as safe and high-level quality products.

Overall, the main threats to the marine environment can be broadly grouped as follows:

- "telluric" pollution (from land-based sources) and in particular: eutrophication and pollution by hazardous substances and nutrients from agriculture, discharge of waste from industrial activities, tourism and urban growth caused by increasing population density;
- fishing and general over-exploitation of marine living resources by national and international fleets, and mostly because of illegal, unreported and unregulated fishing;
- voluntary and involuntary introduction of invasive alien species through ship ballast water, hull fouling and imports of non-indigenous species and pathogens;
- commercial and recreational vessel traffic;
- the physical alteration of costal habitats;
- climate change.

The above mentioned threats lead to significant loss or degradation of biodiversity and changes in its structure, through the contamination and destruction of species, habitats and ecosystems. As a result, there is serious damage to fish stocks, planktonic and benthic communities, fisheries and aquaculture economics, landscape and natural resources on which tourism is based.

The most alarming aspect is that these negative pressures, despite the environmental policies that have been implemented in recent years, are still growing steadily and have now reached a level that can quickly lead to a large-scale systemic crisis.

These threats are, of course, highly interconnected and thus it is necessary to ensure effective governance, through an integrated sea and coastline policy. On the contrary, the existing planning frameworks have a largely terrestrial focus and often do not address how coastal development may affect the sea and vice-versa. Increasing competition for marine space and the cumulative impact of human activities on marine ecosystems make the current fragmented decision-making procedure in maritime affairs inadequate and demand a more collaborative and integrated approach. For too long policies related to sectors such as shipping, fisheries, energy, surveillance and control of the seas, tourism, exploitation of natural resources of the marine environment and research have been going their separate ways, resulting in inefficiencies, inconsistencies and usage conflicts.

It is therefore necessary to address and resolve at a national and international level the two main issues related to the good governance of the marine and coastal environment:

- sectoralization and lack of communication between sectoral policies and instruments of spatial planning, both at a national and international level, leading to fragmentation of actions and overlapping of means, resources and objectives;
- planning, organization and regulation of activities relating to the marine environment in the high sea areas, which also directly and significantly affect territorial waters and coasts.

For this work area the following specific objectives have been identified and are to be achieved by 2020:

1. protecting and preserving the marine and coastal environment, by halting the loss of biodiversity and the degradation of ecosystem services and, where possible, maintaining and/or restoring the optimal conditions of marine ecosystems, to ensure high levels of vitality and functionality of the sea and the production of ecosystem services that derive from it, including the ability to mitigate and adapt to the effects of climate change;
2. ensuring the integration of conservation needs of marine and coastal biodiversity and associated ecosystem services in economic and sector policies, while improving general understanding of the benefits derived from them as well as the costs caused by their loss;
3. ensuring the sustainable use of coastal marine environment through the application of a long-term, ecosystem-based approach to the management of the numerous human activities related to the sea;
4. promoting the development of evaluation tools for ecosystem services derived from marine and coastal environments that can be used for setting up and integrating sectoral policies into planning and programming processes;
5. improving the knowledge of and filling information gaps on the substance, characteristics and conservation status of habitats and marine species as well as on the direct and indirect threat factors;
6. improving the knowledge of the biological and ecological status of the marine and coastal environment through scientific research, to understand, prevent and mitigate biodiversity loss caused by human activities and climate change;
7. promoting the establishment of an ecologically representative and efficiently managed network of marine protected areas in the Mediterranean, that can be monitored using standardized methods to assess the effects in terms of efficiency in protecting biodiversity and enhancing ecosystem services;
8. curbing human pressure on coastal marine environments exerted by the seasonal demand from tourism also through seasonality reduction and changing ways of tourism;
9. developing and implementing integrated policies for the development and conservation of the marine and coastal environment at a sub-regional, regional and global scale, in cooperation with other countries located along the coast within the framework of agreements and international conventions;

10. promoting the dissemination of knowledge and skills that are necessary to recognize, appreciate and assess the marine biodiversity, thereby promoting its sustainable use;
11. enhancing integration between marine and maritime research (on sea transportation infrastructure and use of marine resources), to integrate the culture of biodiversity conservation into innovative products, processes and sea economy services.

The following priority measures for this work area have been identified:

a) adoption and full implementation of Directive 2008/56 (Marine Strategy Framework Directive) to achieve good ecological status of the marine environment by 2020 through the development and implementation of a specific National Strategy;
b) ratification and implementation of the Protocol on Integrated Coastal Zone Management of Coastal and Marine Band (ICZM) and the Barcelona Convention for the Protection of the Marine Environment and Coastal Region of the Mediterranean Sea, adopted in Madrid on January 18, 2008;
c) development and implementation of the Integrated National Maritime Policy, according to an ecosystem-based approach and in compliance with the Marine Strategy, through the Maritime Spatial Planning that takes into account the maritime space and the integrated management of coastal zones;
d) optimization and development of infrastructures in the field of research and strengthening of scientific networks to meet global challenges, such as adaptation to climate change as required by the new EU Integrated Maritime Policy and its Strategic Research Agenda;
e) promotion of programs aimed at the following:
    i. updating information on the species through the development of taxonomic research;
    ii. mapping marine habitats and transitional waters by creating lists of species for each habitat type;
    iii. monitoring the status and levels of exploitation of the marine and coastal environment also through the study of water conditions and planktonic and benthic communities;
f) integration of the national plan for monitoring the marine environment and coastal areas into the objectives arising from Directives 1992/43/EEC, 2000/60/EC and 2008/56/EC;
g) ratification and implementation of the Protocol of the Barcelona Convention "Hazardous Wastes" in order to reduce transboundary movements of hazardous wastes and, if possible, eliminate them;
h) ratification of the following international conventions adopted within the International Maritime Organization: Bunker Oil, Antifouling, Wreck Removal, Ship Recycling, Hazardous Noxios Substances and the OPRC-HNS Protocol;
i) ratification of the Ballast Water Convention; creation of an early warning and rapid response system to prevent the problems related to the transfer of invasive or dangerous alien organisms through ballast water discharged from vessels or biofouling; use of voluntary instruments to reduce the risks of biological invasion;

j) reduction of the by-catch impact in particular on species included in the Habitats Directive and in the IUCN Red List (cetaceans, sea turtles and elasmobranchs);
k) provision of suitable protection along the coastline with nesting sites of sea turtles (Caretta caretta), seabirds (Cory's Shearwater, Shearwater, Shag, Storm Petrel and Corso Seagull) and raptors (Queens Raptor);
l) strengthening of the system of marine protected areas through the establishment of new marine protected areas, the completion of the marine Natura 2000 network, the establishment of Ecological Protection Areas and the designation of Particularly Sensitive Sea Areas (PSSA) in the Adriatic Sea and in the Bonifacio Strait and the development of appropriate synergies;
m) adaptation of fishing policies and full application of EC Regulation 1967/2006 on the management of Mediterranean fisheries and aquaculture, to ensure the maintenance of ecosystem services on which they depend, through the achievement of a satisfactory ecological status;
n) extension of the application of the ecosystem-based approach to fisheries management (the Reykjavik Declaration of 2001);
o) implementation by fishermen of the Code of Conduct for Responsible Fisheries (FAO 1995);
p) definition of appropriate measures within the European Fisheries Fund (EFF) for a real integration of biodiversity conservation into fisheries policies, as required by the NSP and the related Operational Plan;
q) harmonization between competent Ministries and Regional authorities for the implementation of the CFP (Common Fisheries Policy) and Directive 2008/56;
r) support to recreational and sport fisheries, in particular tourism linked to fishing, to promote its recreational and cultural purposes, the correct use of aquatic ecosystems and fisheries resources such as through the creation of interregional networks of sites dedicated to recreational and sport fishing;
s) development of guidelines and specific principles for assessing the environmental impact of aquaculture and intensive fish farming;
t) enforcement of Regulations (EC) 708/2007, 506/2008 and 535/2008 on the use of exotic species in aquaculture and locally absent species;
u) implementation of Directive 2006/88/EC concerning animal health requirements for aquaculture animals and products thereof, and the prevention of certain diseases in aquatic animals and measures to combat them.

Measures at an international and European level

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Measures at a national level

One of the main instruments at a national level is Law No. 979 of December 31, 1982, "Provisions for Sea Protection", which identifies four pillars of the sea protection policy: coastal plan, emergency service of defense against pollution caused by accidents, coastal marine monitoring and establishment of marine protected areas.

The coastal plan outlined in Article 1 of Law 979/82 is defined as a general plan for sea and marine coast protection against pollution and marine environment conservation, to be developed in consultation with the Regions. This plan "directs, promotes and coordinates operations and activities concerning coastal and sea protection against pollution and marine environment conservation, according to planning criteria and with particular emphasis on forecasts of potentially dangerous events and on the actions that are needed to curb and counteract the related effects".

Under this law, the central government is responsible for developing a planning instrument for maritime activities and land use, aimed at striking a balance between the requirements of local economic and social development and conservation needs. The coastal plan has not yet been implemented, however, pursuant to subsequent legislation, the central Administration has maintained its function of monitoring the marine environment; Legislative Decree 112/1998 established that the tasks relating to the protection, safety and quality of the marine environment are of national significance and that the functions relating to coastal environment protection should be carried out concurrently with the Regions.

To ensure pollution control and monitoring of ecosystems, Law 979/82 provided for the creation of a network for observation of the marine environment quality which performed periodic monitoring of the sea while collecting oceanographic, chemical, biological and microbiological data as well as the establishment of a "National Center for overall coordination and data collection".

To meet this regulatory requirement, since 1989 the MATTM has organized, coordinated and funded the Monitoring Programs of Italian coastal marine environments in cooperation with 15 Italian coastal Regions and peripheral public laboratories; at the Directorate for Nature Protection, the MATTM also set up a database that collects, processes and publishes data arising from the analysis and an operations Center that coordinates anti-pollution measures in case of accidents.

It was thus possible to set up a network for observation of the marine environment quality as required by Law 979/82. Moreover, in recent years, in addition to the analytical activity, intensive training activities as well as training and refresher courses were organized for peripheral operators who were able to spread uniform methodologies within the network for assessing the quality of Italian seas and to create a wealth of knowledge and expertise in the environmental field.

The efforts made by the Ministry, the Regions and peripheral laboratories resulted in the creation of a quality control system for the coastal marine environment which to date has no equal either at a European or Mediterranean level in terms of quantity, quality and completeness of the information collected.

The creation and establishment of marine protected areas, especially if it is provided for by a planning instrument for coastal marine areas, represents a significant contribution to biodiversity conservation and a strength of biodiversity conservation, to the provision of ecosystem services and to climate change adaptation and mitigation.

Statutory provisions have identified a total of 52 potential park areas whose conservation, through the establishment of marine protected areas, is considered a matter of priority: for 32 of these Areas there are already conservation measures, consisting of 27 marine reserves, 2 national parks extending to the sea, 2 underwater archaeological parks and the great international Sanctuary for marine mammal protection.

A total of more than 270,000 hectares of protected waters and seabed, account for over 12% of the coastline, not to mention the 2,500,000 hectares of national waters within the Sanctuary.

Italy counts seven marine protected areas in the SPAMI (Specially Protected Areas of Mediterranean Importance) list: Portofino, Miramare, Tavolara Island - Punta Coda Cavallo, Plemmirio, Torre Guaceto, Punta Campanella and Capo Caccia - Isola Piana as well as the international area of the Marine Mammal Sanctuary which should also be added.

In order to fulfill the commitments under the “Habitats” Directive with regard to the sea, Italy has started identifying sites in territorial waters and conducting a survey in the high seas on a scientific basis.

The objective of the survey is to update the knowledge framework from a scientific point of view with regard to the distribution and representativeness of the habitats and species of Community interest, in view of a revision of existing marine SCIs and identification of new ones, based on the scientific reservations expressed for each bio-geographical region. At the same time, consultation arrangements with the Regional Administrations have been started to complete the designation process for SCIs in territorial waters and to establish appropriate management and conservation measures.

As regards the protection of marine areas beyond national borders, Law 61/2006 has authorized the establishment of EPZ (Ecological Protection Zones) from the outer limits of Italian territorial waters and up to the limits established on the basis of agreements made with the Countries whose territory is adjacent to Italy’s territory or in front of it.

In the zones of ecological protection, Italian and European Community laws and some international treaties that are effective in Italy are enforced with regard to the prevention and abatement of all types of marine pollution, including pollution from ships and ballast water,

pollution by dumping of wastes, pollution from exploration and exploitation of the seabed and atmospheric pollution as well as mammal protection, biodiversity conservation and protection of the archaeological and historical heritage. Fishing activities are excluded by law.

The EPZs represent potential areas within which marine SCIs could also be identified provided they are recognized as having biological value under the Habitats Directive.

Currently, however, no EPZ has been established. As part of the agreements mentioned in Law 61/2006, negotiations with France are under way.

With regard to the transposition of Directive 2008/56, Law No. 88 of July 7, 2009, "Provisions for the fulfillment of obligations arising from Italian membership to the European Community - Community Law 2008", entrusts the Government with the task of drawing up the legislative decree transposing the Directive by the date specified therein (July 15, 2010).

The protection of the marine environment is closely linked to the complex issue of integrated management of coastal areas, which has been under way for some time at an international and European level, and only recently at a national level. In particular, according to the provisions of the Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe (2002/413/EC) of May 30, 2002, the Marine Strategy Framework Directive 2008/56/EC for the marine environment, the Protocol on integrated coastal zone management in the Mediterranean of the Barcelona Convention and the related Resolution and as consistently required by the Carta di Siracusa on Biodiversity, Italy is called upon to draw up a National Strategy for Integrated Coastal Zone Management (hereafter called ICZM Strategy).

The drawing up of an ICZM strategy is in fact the actual "instrument of governance" of marine and coastal areas.

To overcome the fragmentation of expertise among the various levels of government, the MATTM has launched a comprehensive institutional collaboration in the field of Integrated Coastal Zone Management, through the involvement of regional and local authorities in planning and managing Coastal Zones to define the Strategy and draw up Plans/Programs or Guidelines for the ICZM Strategy. In organizing the work, special consultation offices will be made available to stakeholders, having social and economic interests, in order to ensure adequate input and consideration for all interests relevant to ICZM.

Currently, the law for the ratification of the Protocol is being defined and the concurrent drawing up of measures, aimed at transposing directives into national law to safeguard the protected areas beyond their borders, thereby integrating them into water and land use planning.

The Coastal Area Management Programme (CAMP), adopted at the Sixth Ordinary Meeting of the Contracting Parties to the Barcelona Convention (Athens 1989), is of particular importance in the context of the ICZM Protocol. The main objective is to develop and implement strategies for the sustainable development of coastal areas, and to this end, identify and apply appropriate tools and methodologies for the management of significant sample areas.

In this context, the CAMP Italy Project, which involves 5 Italian regions, will be used to field test new governance models for coastal areas in line with the principles and objectives of the Protocol.

Invasive alien species are now globally recognized as one of the main threats to the world's oceans; they can endanger biodiversity, lead to serious health problems and pose a threat due to their impact on fishing, aquaculture and maritime economies. The EU Commission issued a communication entitled "Towards an EU Strategy on Invasive Species". The Directorate for Nature Protection, in collaboration with ISPRA, is currently working on an early warning system through the creation of a risk map of Italian ports and the development of a monitoring protocol of harbor waterways, in preparation for the establishment of a national strategy on alien species; it has also produced an atlas of alien species that are present in the Italian seas, developed a GIS mapping of alien species in the Italian seas through a check list of non-native species introduced in aquarium and aquaculture systems and created a tissue bank of alien species.

With regard to aquaculture, the MiPAAF has drawn up appropriate guidelines for the transposition of EU Regulation 708/2007 on the introduction of exotic species in aquaculture, by setting up a national register for exotic species.

The implementation of the objectives of this Strategy with regard to the protection and sustainable use of marine biodiversity is strongly linked to the implementation of the Common Fisheries Policy (CFP) and the competences in the field of fisheries of the Directorate General for Fisheries and Aquaculture of the MiPAAF, the Regions and Autonomous Provinces.

The new CFP integrates environmental and economic components in a logic of sustainability so that, with regard to fishing, national policies (Legislative Decree No. 154/04) must be planned for the purpose of protecting and conserving marine ecosystems and the resources fished.

The MiPAAF drafted the Fisheries Operational Program 2007/2013 for Italy in line with the macro objectives of the EFF Regulation. The Program was approved by the EU Commission on December 19, 2007 together with the SEA of the same Operational Program (OP). Both the SEA and the OP were drafted with the involvement of all economic, social and environmental partnerships. In addition to integrating the SEA, the Environmental Report and the Summary Statement in the list of program documents, the CFP of the European Union considers the need to protect fish stocks and their habitat as a matter of priority, whether it be marine or inland waters.

The measures financed by the EFF are divided into 5 priority axis of action, each one corresponding to a "thematic area". It is enough to have a quick look at the Axis and the EFF measures to realize that environmental protection and fish biodiversity conservation are of absolute primary importance:

Axis I: Adjustment of the Community fishing fleet: includes several measures to protect fish stocks, to be achieved through recovery, management and disarmament plans, aid for temporary cessation of fishing activities and replacement of equipment with more environmentally-friendly fishing methods to reduce the impact.

Axis II: Aquaculture, inland fishing, processing and marketing. This axis includes several measures that directly or indirectly protect the quality of the environment and fish stocks: investments in aquaculture, aqua-environmental measures, veterinary measures, inland fishing and measures for the processing and marketing of fishery products and aquaculture. In particular, with regard to the aquaculture measure, a number of sensitive objectives have been identified concerning the following: the application of techniques which reduce the environmental impact or enhance the positive effects of the environment, types of aquaculture that allow environment, natural resources and genetic diversity to be protected and improved.

Axis III: Measures of common interest: the third axis includes measures of environmental and wildlife interest such as: protection and development of aquatic fauna and flora, collective actions, measures for ports, landings and fishing shelters and pilot projects.

Axis IV: sustainable development of fisheries areas: the fourth Axis is totally focused on the social, economic and environmental development of fisheries areas. The approach is bottom-up, i.e., those who propose and activate the various measures (borrowed from other Axis) in a localized geographic context, belong to the private and public sector of that place; they form "Groups" that have sufficient administrative capacity to ensure the sustainable development of the area. The protection of the environment and fish stocks is listed as one of the primary goals of sustainable development strategy.

Axis V: Technical assistance: technical assistance contributions can be activated to finance the preparation, implementation, monitoring and control of EFF measures. This may also apply to research, surveys, statistics collections, the disclosure of information and the establishment of national and transnational networks of players who are involved in the sustainable development of fisheries areas.

In 2008, two new EU regulations entered into force, to which Italy will have to adapt, that address two important issues aimed at ensuring and extending the goal of sustainable fisheries outside Community waters and in any case also to non-EU vessels operating in Community waters:

- prevention and deterrence of illegal, unreported and unregulated fishing (Regulation 1005/2008 EC);
- regulation on Community fishing vessels outside Community waters and the access of third country vessels to Community waters (Regulation 1006/2008 EC).

8. Infrastructures and transportation

The transportation sector plays a strategic and essential role in Italy's economic development and is an economic sector that exerts strong pressure on environmental and natural resources.

The demand for transportation in Italy has increased rapidly over the past decade and is forecast to continue to grow in the future despite the current economic crisis: the definition and implementation of policies for controlling and mitigating environmental externalities attributable to transportation are thus becoming necessary.

The infrastructure network is under constant development, both in Italy and Europe, and thus, motorization is growing rapidly: it is estimated that by 2025 the rate will be between 161 and 198% higher than in 1993.

From 1999 to 2005, the primary road network in our country (based on data provided by the MIT - Ministero per le Infrastrutture e i Trasporti (Italian Ministry for Infrastructures and Transportation) in 2005) was 13,414 km longer (+8.2%). During the 1990 – 2005 timeframe, the number of vehicles grew from 36,582,952 in 1999 to 50,243.520 in 2005 (more than 72%). With regard to passenger transportation, in our Country road traffic covers a share of 92.4%, (2005 MIT data), rail transportation 5.9%, air traffic 1.3%, and maritime transportation 0.4%. With regard to goods, road traffic accounts for 65.8% (2005 data). According to ISTAT, from 1990 to 2005, 3 million and 663 thousand hectares of free surface were occupied by transportation infrastructures in Italy, an area the size of the Lazio and Abruzzo regions combined.

The critical issues of the sector are reflected in the following significant environmental effects: consumption of non-renewable energy sources, air, noise and light pollution, land take, fragmentation of the territory, visual intrusion and damage to historical-artistic heritage and landscape and disturbance of the species.

The impact of an infrastructure on biodiversity changes in relation to the distribution of habitats, the presence, distribution and biology of the species, the impact on ecological processes that are necessary to ensure the viability of these habitats and populations of different species; and, of course, the reference scale used for the analysis of impacts on and interference with ecosystems also plays an important role.

The evaluation of the impact on ecosystems by a piece of work, that is conducted exclusively on the basis of an analysis of specific interference with the territory by possible or proposed routes, is of course an oversimplification, since some aspects related to (direct or indirect) impacts of large areas on biotic communities and individual species are not taken into consideration; these types of impacts, however, are difficult to evaluate because of the complexity of the ecological systems and processes that govern them, and because of the limited knowledge that is available today in our Country concerning the operation of ecosystems and

the trends of the populations of the various species in relation to the fragmentation of the territory.

To reduce pressures on the environment by the transportation system, European policies have mainly focused on technological innovation for vehicles and fuels. These approaches alone are not sufficient to ensure the reduction of greenhouse gas emissions in the sector, while an intensification of pollutant input has occurred due to increased volumes of traffic.

More recently, the prevailing attitude in Europe is to try to maintain a steady growth in the transportation sector and to improve the modal split.

The focus then turns to mobility policies, which should facilitate the internalization of costs, voluntary agreements with the industries, revitalization of rail networks and inland waterways, definition of objectives and targets, improved coordination of spatial planning and use of the SEA in support of infrastructure planning.

The problem of mobility is usually examined in terms of transportation and the variables that determine its trend. The demand for mobility, however, is the result of actions and policies that do not often relate directly to the transportation sector, but that necessarily rely on transportation for their fulfillment (e.g., business trips, vacations, entertainment, and the relational system in general).

In the European Commission's White Paper: "European Transport Policy for 2010: Time to Decide": the focus is on the measures to take to adjust infrastructure tariffs, including external costs (costs related to health, environment and safety); one of the policy measures that is necessary to adopt is "disengagement between increased mobility and economic growth, achieved without having to restrict the mobility of people and goods. The best use of alternative modes will also significantly reduce the increase in the volume of goods transported by road (28% instead of 50% between 1998 and 2010)".

The Piano Generale dei Trasporti e della Logistica (PGTL) (General Transport and Logistics Plan) of our Country (approved in March 2001) reads that "the growth of traffic and the prevalence of road transportation are the cause of negative externalities in terms of environmental impact and accidents. This includes phenomena on a global scale, such as climate change or long distance air pollution, and more localized phenomena, such as deterioration of the acoustic environment along traffic lines, short-range air pollution, damage to soil stability, hydro-geological balance, landscape and biodiversity".

In the Carta di Siracusa on biodiversity, in the section on "Biodiversity, Economics and Business", the following commitment appears along with others: "avoid or reduce any negative impact on biodiversity from development programs of infrastructures, and consider how such programs can effectively contribute to investments in Green Infrastructures/Ecological Infrastructures".

For this reason, the European Environmental Agency technical report on transportation (No. 12/2008) suggests a more integrated transport policy for mobility with the exogenous factors that generate the pattern.

The main threats to biodiversity can be summarized as follows:

- infrastructure pressure on natural habitats and animal populations;
- the development of urban sprawl;
- consumption of natural areas to accommodate new infrastructures;
- air, noise and light pollution;
- landscape fragmentation and interruption of the territory's ecological connectivity;
- increase of factors influencing climate change.

The specific objectives are as follows:

1. focusing on the optimization of existing networks instead of building new major works;
2. carrying out a thorough assessment of efficiency standards for infrastructures in relation to their functions and the ecosystem values and services of the territory where the work is going to be carried out, thereby reducing and limiting environmental fragmentation;
3. preventing further urban sprawl and city corridors, by adopting rules, quality criteria and quantitative limits for urbanized areas and road networks which take into account the status, distribution and function of natural resource systems;
4. limiting the use of non man-made soil by opting to recover and/or expand, where possible, existing infrastructures;
5. integrating policies on the mobility, infrastructures and transportation into territorial planning which will allow for a full assessment of the impact on environmental components and biodiversity;
6. protecting natural areas and habitats;
7. verifying the effectiveness of the application:
    i. of the SEA to integrate environmental issues in the drawing up of sustainable plans and programs, with special reference to the management of mobility and transportation in order to define a trend towards the sustainability of plans in the sector based on indicators and objectives that are explicit in terms of quantity and quality (reduction of soil consumption, natural resources and emissions);
    ii. of the EIA to assess the potential effects that the construction of a linear or punctual piece of work can have on habitats, animal and plant species that are present in a wide area;
    iii. of the VincA (Environmental Effects Assessment) to identify and assess the possible effects that a project can have on habitats and species of Community interest and Natura 2000 sites;
8. identifying solutions to mitigate the impacts during both construction and operation of the infrastructure;

9. identifying environmental compensation measures where adverse residual impacts cannot be mitigated;
10. applying the procedures of the landscape report (Prime Minister Decree of 12 December 2005) to identify the best solutions for integrating infrastructures in the naturalistic landscape context;
11. mitigating noise, light and air pollution through appropriate solutions that provide green areas and the maintenance/creation of ecological corridors and natural habitats.

The priority measures to be implemented in this work area can be summarized as follows:

a) redevelopment of natural habitats on the margins of linear and punctual infrastructures;
b) integration of infrastructures in the ecological network;
c) naturalistic and landscape recovery of urban/peri-urban areas affected by degradation on the margins of road/rail infrastructures, by eliminating any interruption between urban areas and buffer zones for sediment produced from the construction of infrastructures;
d) promotion of sustainable types of mobility in urban areas;
e) increase of green spaces in urban areas that can serve as pollutant filtration systems;
f) adoption and implementation of naturalization and bioengineering techniques while integrating infrastructures in the environment;
g) implementation and updating of skills on environmental issues (with special emphasis on biodiversity conservation) of the human resources involved in the infrastructure and transportation supply chain.

Measures at an international and European level

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Measures at a national level

The main legislative measure at a national level is the Interministerial Decree "Sustainable Mobility in Urban Areas" of March 27, 1998.

In January 2007, the MATTM coordinated the first meeting of the National Board on Sustainable Mobility, thereby confirming that Finance Act 2007 included a sustainable mobility fund of 90 million euros per year for the 2007-2009 timeframe. In addition to the funds provided for by the Finance Act, the MATTM has already allocated 70 million euros a year (for three years) for the co-financing of the activities indicated in the air quality recovery plans developed by the Regions and Autonomous Provinces, 20 million for the re-launch of methane and 10 million for the refinancing of the car-sharing initiative.

Moreover, about 200 million euros per year were allocated from the revolving fund for Kyoto for the 2007-2009 timeframe as well as other amounts from EU research and innovation funding.

9. Urban areas

Urban areas currently host the majority of the world population. According to UN - Habitat[1], the UN agency dedicated to these areas, in Italy, 68.4% of the population lives in urban areas, just like 61.5% in Liberia, 53.7% in Indonesia and so on.

This massive concentration of people gradually causes a number of significant stress factors that put pressure on ecosystems and natural resources in general. Soil sealing, discharges into water bodies, air emissions of toxic substances harmful to humans and other living organisms and waste production are environmental pressures originating in urban areas.

These pressures have an impact on the environment that is the closest to the areas of localization of the single sources, thus in the urban areas, and on geographical areas that can be significantly larger. In the first case, the effects will be more evident in the health sector and, in general, will reflect on the quality of life of the urban population. In the second case, impacts are exerted on natural resources, also on a global basis, such as biodiversity loss, climate change as well as the ecological quality of water bodies, and the ensuing effects on sustainable development.

Growth projections for cities are commensurate with the estimates of the growing migration of population towards man made landscapes, connected and constructed.

The demand and consumption of resources, phenomena that are related to population growth and the extension of urban areas, are steadily increasing, and thus, this requires efforts for the integrated management of the urbanization phenomenon.

During the G8 Environment meeting in Syracuse, the following statement was made: "the direct destruction of ecosystems, fragmentation of natural spaces, disturbance of other species, especially the introduction of "exotic" species, pollution and islands of urban heat are among the most significant risks to biodiversity in places characterized by human inhabitation, especially in coastal, forested, agricultural and urban areas".

These components make up the complexity of the urban phenomenon, which is structured in various types and modules depending on the morphological, economic and also cultural substrate, and includes new definitions of landscape and identity heritage, introduced by the European Landscape Convention.

It is therefore necessary to pursue the general objectives of sustainability, which in urban areas has a multifaceted definition: social and economic sustainability of development and settlement patterns, environmental sustainability of man-made contexts vis-à-vis their relationship with "natural" areas and so on.

These issues must be integrated into the management of territorial transformations and in the planning and design of cities whose welfare is derived from models of harmonious development laying the foundation on which to base contemporary society.

[1] Cfr. UN-HABITAT's Global Urban Indicators database.

Urban setting is crucial for biodiversity and climate: when soil consumption reduces green and permeable spaces and replaces them with asphalt and concrete, there are noticeable changes in climate, landscape and a significant amount of biodiversity loss.

The ecosystem services provided by soil biodiversity, for example, are replaced by impervious surfaces that allow significant increases in water runoff (which, in turn, causes an increase in soil erosion in adjacent areas), the extremization of heat exchanges and the cancellation of the filter and buffer against pollutants. The biotic community undergoes a severe trivialization with consequent loss of ecosystem resilience.

The effects of weather events can be significantly mitigated in urban settlements that are made more adaptable to climate change, while providing for measures that help preserve biodiversity.

The main tool to ensure proper management of urban areas, where to integrate the fundamental component of biodiversity, is the municipal development plan which, despite the lack of a framework law for the territorial government, must be able to implement the recommendations set out in national and international policies on environment and biodiversity conservation within the local context. The correct application of the SEA, a mandatory functional tool for processing programs that are consistent with the resources on which they are based and which these measures are called upon to manage, will allow the achievement of environmental protection and the promotion and conservation of biodiversity as well as the mitigation of the effects of anthropogenic pressures and climate change.

The government's plans for the territory must include management plans for existing and future green spaces while taking into account the biological and vegetation dynamics that the implementation of the plan will bring about across the entire territory, not only on a small scale.

To ensure ecological continuity also in the urban context, plans must include forecasts for maintaining the so-called "ecological corridors", or natural elements connecting two or more areas of habitat. Ecological corridors in urban areas, real "gaps" between anthropogenic and constructed areas, allow a continuum environment within which living species can move, allowing a connection which is essential for biodiversity and the genetic exchange between populations.

Ecological corridors are particularly effective at conserving biodiversity, reducing the physical separation between animal and plant populations, including real linear barriers (highways, freeways and major railroads), common barriers (cities and industrial or commercial areas) and the lack or ineffectiveness of natural areas connecting populations.

Ecological corridors include the following elements: natural areas, riparian vegetation along river sections, bands of trees and shrubs along linear infrastructure (roads, railroads and canals) and linear corridors of herbaceous vegetation in wooded matrices.

In urban areas it is therefore necessary to promote the maintenance of green spaces and work towards redeveloping the natural areas system to ensure, even in anthropogenic areas, the continuity of biodiversity.

This must be done by integrating specific measures in building regulations to promote the redevelopment of buildings with energy-saving solutions containing vegetation aspects, which may be integrated with photovoltaic roof gardens, green walls with vertical ground level green spaces and integration of greenery into building.

In brief, the following threats have been identified:

- habitat loss and degradation caused by physical alterations to the soil due to the presence of impermeable layers (population growth, particularly along the coast, along with the development of economic activities, environmental changes due to infrastructure and land use changes);
- problems regarding municipal waste management;
- heat island effect resulting in localized changes in ecosystem conditions;
- increase of anthropogenic areas at the expense of natural areas;
- lack of habitat continuity in urban areas;
- disruption of wildlife corridors;
- introduction or release of non-native or incompatible species with regard to the local or territorial environment;
- effects of the concentration of specific pollutants linked to human activities.

The specific objectives can be summarized as follows:

1. limiting the consumption of non-anthropogenic land;
2. protecting and preserving urban ecosystems, even if residual;
3. ensuring the integration of biodiversity conservation in urban systems while stressing the need to maintain corridors and ecological connectivity;
4. ensuring the sustainable use of resources in urban areas;
5. improving the knowledge of the ecological status of urban environments for a better understanding of their potential role in the maintenance of ecosystem services and in the quality of life in this area;
6. promoting the recovery of brownfield sites in urban areas by integrating predictions of permeable soil and natural areas;
7. integrating green plans into local urban planning;
8. implementing the SEA to integrate environmental considerations into training plans and sustainable programs;
9. including the option to make innovative choices for building recovery and new constructions in municipal building regulations, including roof gardens and green walls;
10. restoring natural areas within cities, with special reference to green spaces, wetlands and riparian strips, thereby ensuring the maintenance of natural habitats also within urban areas;
11. improving the understanding of the ecological status of urban environment and educating citizens on the impact made by human activities and climate change on biodiversity.

The following priority measures have been identified:

a) developing urban environmental indicators showing the data needed to monitor trends within urban environments, to evaluate the effectiveness of initiatives and the progress made in creating a good quality and healthy environment, to set objectives and to help guide decision-making processes to achieve more sustainable outcomes;
b) promoting best energy-saving technologies in buildings and reducing paved and cemented surfaces to ensure soil permeability and restore a more natural water cycle;
c) optimizing waste cycle;
d) promoting the environmental redevelopment of urban areas by encouraging integrated projects for the recovery of built areas and natural habitats;
e) creating and maintaining ecological corridors in urban areas;
f) promoting the drawing up and full implementation of urban plans with special emphasis on the aspects of nature and biodiversity, including those of urban soils.

Measures at an international and European level

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Measures at a national level

The following are the main regulatory instruments at a national level:

- the Inter-Ministerial Decree on Sustainable Mobility in Urban Areas of March 27, 1998;
- Law 142/90 with subsequent amendments, Laws No. 81/93, 415/93, 437/95, 127/97, 120/99, 265/99, redefined by Legislative Decree No. 267/2000;
- Law 266/97 for the redevelopment of urban areas, mainly geared towards regional governments for the implementation of the national legislation;
- Presidential Decree No. 380 of June 6, 2001, Consolidation Act of building laws and regulations;
- Decree issued by the MIT of August 7, 2003 "Programs concerning the economic and social regeneration of cities and neighborhoods in crisis, to promote sustainable urban development. URBAN - Italy";
- Legislative Decree No. 42 of January 22, 2004, Code of the Cultural and Landscape Heritage;
- Decree issued by the MIT of March 8, 2006, "Completion of innovative programs in urban areas – Neighborhood Contracts II".

10. Health

The United Nations recognizes the need to reconcile biodiversity conservation and the promotion of health and human welfare.

Despite this recognition, biodiversity conservation and human health in general are not always addressed within the same context of strategic planning.

The quality of ecosystem services that are fundamental to human health such as water and air purification, oxygen production and several raw materials, the agricultural productivity of our lands and the biological, chemical and nutrition safety of our foods are closely linked to our ability to conserve biodiversity.

Many national and international[2] initiatives have been undertaken for the study, analysis and development of cognitive tools aimed at better understanding the complex relationship between biodiversity and health and the impact that biodiversity changes have on the following:

- loss and availability of medicinal plants (medicinal, aromatic and natural pigments) for the research and treatment of many diseases and their application to the textile, food and medical sectors;
- determinism and distribution of infectious diseases and allergies;
- toxicological risk of new species or modification of the toxicity of plant and animal species.

National or local strategic measures should therefore take into consideration the risk (threats) to health and well-being in their planning that can be posed by the following:

- reduced availability of species for medical care and, for some communities, the inability to practice traditional medicine;
- reduced availability of plant species to be used for the extraction of natural dyes for textile, food and health applications;
- increased and altered distribution of infectious disease vectors;
- ecosystem alterations facilitating the contamination of biota and the transmission to humans, and from human to human, of pathogens;
- an increase in the number and distribution of the population allergic to the introduction of alien species;
- agricultural practices having an impact on the nutritional, biological and chemical safety of food;
- increased risk of exposure to toxic substances of alien species, especially in aquatic ecosystems;
- synergy with any alteration of the biosphere caused by climate change;

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[2] Some examples:
Millenium Ecosistem Assessment, http://www.millenniumassessment.org/
COHAB 2 - Second International Conference on Health & Biodiversity, 2008
VIII National Congress on “Biodioversity - a resource for multifunctional systems”, Biodiversity, Environment and Health Session.

Climate changes and alterations to the water cycle are amplifying and accelerating these risk conditions as it is underlined in the IPCC Fourth Assessment Report and in the evaluation of scientific evidence and impacts observed by the World Health Organization (WHO) in partnership with international, European and national institutions. Global warming and climate variability have in fact an impact on the physiology, distribution and adaptation of species.

The complex correlations to date do not allow to establish a cause and effect, linear relationship, nor to assess the fraction attributable to the loss and alteration of biodiversity in the determination of health effects in the short, medium and long term, especially in a scenario of global changes, including climate change, urbanization and land use.

The prevention goals, however, require the development of tools for the study and analysis of significant risk conditions for the protection of health and a healthy sustainable development as well as the integration of their main aspects into the plans and programs for the protection and conservation of biodiversity.

The protection of important species for the treatment of disease applies not only to natural and herbal medicine; many products are in fact used in conventional medicine, or as natural dyes for textile, food and health applications. Therefore, in this area, biodiversity conservation has a threefold purpose: on the one hand preserving the heritage that is necessary to produce therapeutically active compounds, on the other, reducing the exposure to synthetic chemicals by preserving the quantity and quality of natural products and, last but not least, providing therapeutic benefits in rural communities that rely primarily on natural medicine for economic or cultural purposes. About 20,000 traditional medicinal plants are at risk of overexploitation and some are threatened with extinction.

The loss of medicinal plants and medical knowledge related to them, will have a negative impact on scientific research and health, particularly for vulnerable populations such as rural communities. In the last decades new plant conservation strategies, most of which focused on the survival of individual species, have been implemented at a local, national and international level.

According to the BGCI (Botanic Gardens Conservation International), a group founded in London in 1987, with 2,500 botanic gardens from 120 countries, the disappearance of many plants could harm not only “natural” medicine, but also conventional medicine, because more than 50 percent of prescription drugs are derived from chemicals that are found in plant species.

In addition to compromising their key role in providing goods such as food, medicines and raw materials, the degradation and loss of ecosystem services cause the loss of the buffering effect and sustainability impact on air, water and soil quality, essential to human health, through filtration and purification mechanisms (e.g. forests and atmospheric composition, the role of wetlands in recycling and absorbing anthropogenic nutrients), detoxification of chemical compounds in soils and sediments (microbial degradation) and the presence of natural predators of infectious diseases vectors.

Alterations in the quality and availability of ecosystem services and an increase in the variability of global and local meteorological conditions may synergistically affect the safety of food production and the determinism in the risk of infection from the use of contaminated water and biota (e.g. contamination during flood events) or indirectly from an increase in the number and geographical distribution of insect vectors of pathogens.

Alterations of ecosystems and local meteorological conditions synergistically promote conditions favorable to invasive species by influencing the use of pesticides and, reportedly, the chemical safety of food, soil and water.

Effective health protection from food hazards requires food safety management and good agricultural practices based on a growing understanding of the effects arising from the synergy between climate change and biodiversity alterations.

Among the insect vectors in Italy, the Aedes albopictus, better known as "Tiger Mosquito", whose rapid spread has been growing across the national territory, is the most common species found in urban areas due to the alterations of temperature and moisture which favor the growth and persistence of the mosquito populations. The presence of Aedes albopictus is usually a health problem because it harasses humans and is very aggressive; it poses an even more serious threat given its ability to spread exotic viruses such as the chikungunya[3] virus, aka the West Nile Disease, of which some cases have already been reported in Italy.

Among the new invasive alien plant species that produce highly allergenic pollen is the Ambrosia artemisiifolia which thrives in green, uncultivated fields or abandoned land. Although the Ambrosia was only recently imported from America, is already spreading fast in the northeastern and central part of Italy to the point that some Regions requested ad hoc legislation for managing the problem.

Moreover, global warming in the past few years has been creating the ideal conditions for the growth and spread of airborne fungal spores. Some fungal spores can cause allergic reactions and/or plant diseases. In addition, fungal infestations promote the use of additional chemical treatments, thereby increasing the risk of chemical contamination of food and cash crops for human consumption.

The occurrence of alien species in aquatic ecosystems associated with rising sea temperatures can pose risks to human health. The presence of toxic algae and cyanobacteria has also been reported in Italy:

Many Italian coastal stretches have been affected by the appearance of the Ostreopsis ovata . The flowering (blooming) of this seaweed has been associated with respiratory problems and fever. Some varieties of Ostreopsis produce palytoxins which have potential effects on the cardiovascular system.

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[3] In August 2007, the first indigenous cases were reported in Emilia Romagna.

 In 2005, about 200 people near Genoa became ill following exposure to the Ostreopsis ovate. Similar but less serious episodes were reported along the coasts of Lazio and Apulia.

Based on this brief background, the issue today is not whether or not to act to protect public health but what action should be taken and, more importantly, what measures should be implemented to integrate aspects relevant to health - risks and benefits - into strategies for biodiversity protection and conservation.

A major effort should be devoted to the development of new methods and models to assess the risk associated with ecosystem degradation. To that end, it is necessary to prepare a synthesis of the enormous amount of data resulting from different sources and to develop risk assessment methods which are currently inadequate to handle the large number of variables involved in the affected environmental processes.

The research should address the retrieval of more relevant data and parameters allowing the development of indicators to monitor the impact and effectiveness of the actions taken. The use of the eco-regional scale, compared to the national one, might allow a more proper connection with ecological variables.

The governance of many of the health risks due to ecosystem degradation and the synergies with climate variability and change requires a series of mechanisms and tools to be developed within an overall framework for the program to achieve specific goals, including:

1. integrating aspects relevant to public health into plans and programs for the protection and conservation of biodiversity through the development of cognitive tools (such as databases of interest, indicators, ad hoc monitoring projects of species of interest for medical risk and human well-being) and tools (such as integrated environmental management guidelines of toxic and/or allergizing species and insect vectors);
2. raising public awareness of the importance of biodiversity and ecosystem services for health protection through the integration of these issues into environmental education policies;
3. promoting biodiversity conservation for the protection of health and wellness within activities and projects that are carried out locally, in connection with negotiations, and at an intergovernmental and intersectoral level;
4. improving our knowledge of the health risks and impacts caused by the impact on biodiversity related to climate variability and change;
5. ensuring the sustainable protection and management of plant and animal species that are important for food preservation and nutritional safety;
6. developing health and environmental early-warning and response systems to face emerging risks from alien species;
7. preventing and monitoring diseases carried by specific vectors through integrated environmental management;
8. ensuring the sustainable protection and management of plant and animal species that are necessary for therapeutic and biomedical research;

9. strengthening the synergy between biodiversity conservation and human health and welfare at a national level.

The priority measures in this work area include the planning and implementation of the following tools:

a) cognitive tools (databases, indicators) to monitor the impacts on medicinal plants at a national level and on the appearance of major toxicological, infectious and allergological alien species;
b) operational tools (guidelines, monitoring and integrated environmental management protocols) for the prevention of vector-borne infectious diseases and new allergenic and toxic species;
c) training programs for professionals in the sector;
d) actions aimed at providing information and raising public awareness.

Measures at an international and European level

[*omissis*]

Measures at a national level

There are no structured research, monitoring or evaluation activities to date related to biodiversity and health.

Among the policies for the protection of public health related to biodiversity conservation are those regulating GMOs and the one monitoring insect vectors of infectious diseases.

The fundamental piece of legislation in the sector is represented mainly by two EC Regulations No. 1829 1 1830/2003 governing the approval, labeling and traceability of food and feed products consisting of or derived from GMOs.

During the period 2006 – 2008, the Ministry of Health drafted a National Control Plan on the presence of genetically modified foods in order to plan and coordinate activities aimed at assessing compliance of food products with the requirements set out under Community and national legislation. This plan also ensures the flow of information between the Regions and the Autonomous Provinces of Trento and Bolzano and Central Authorities.

In particular, this Plan is addressed to the Health Authorities having territorial jurisdiction and provides uniform criteria for inspection and control planning.

The National Institute of Health guidelines for the surveillance and control of Culicidae (mosquitoes) of medical interest [Tiger Mosquito (Aedes albopictus) potential vector of dengue – chikungunya or arthropod-borne virus West Nile Disease (WND); (Culicoides imicola) potential vector of the Blue Tongue Disease (BTD)] are updated on a regular basis in order to monitor the development and dissemination of vectors.

11. Energy

The impacts on biodiversity of energy vary considerably depending on the various phases of the energy cycle - production, transfer/distribution, transformation and final consumption – and on the energy source used. The impact also varies significantly with the different options for each phase, in particular in the production phase.

With regard to traditional energy sources (oil, natural gas and coal), the mining activities of fossil fuels are conventionally included in the "production" phase. These activities can have a significant impact on the biodiversity of sensitive areas such as wetlands or marine areas of medium-low depth.

The energy transformation of fossil fuels through combustion processes results in the emission of substances that contribute to climatic changes or to the processes of acidification, eutrophication and the formation of the tropospheric ozone, with a direct and indirect impact on biodiversity. In Europe, the situation with regard to acidification has improved significantly and is expected to improve further.

Most of the vegetation and agricultural crops are exposed to ozone levels that exceed the long-term objectives recognized by the European Union in Directive 2002/3/EC on ozone levels in the atmosphere. Furthermore, combustion plants (in particular those fueled by coal and lignite) release heavy metals into the atmosphere, such as, for example, mercury, lead and cadmium, that can accumulate in biological organisms in time, with potentially toxic effects.

The use of fossils fuels is also related to the risk of sea pollution by hydrocarbons, to which the Mediterranean is particularly exposed since, with its 1% of the global sea surface, it is crossed by 28% of the world's tanker traffic.

The technological upgrading of the oil tanker fleet and the strengthening of the regulatory environment at international and national levels, has avoided any major oil spills in our seas ever since the 1991 incident caused by the oil tanker Haven and the fire of Agip Abruzzo. Nonetheless, since our country depends greatly on oil imports and has a number of refineries on the coast, there is a continued risk of oil spills and maritime accidents.

Finally, the production of energy originating from fossil fuels, gives rise to additional environmental pressure related to land consumption for the construction of power plants, refineries, transmission lines, and mining activity. This can lead to the degradation and fragmentation of the ecosystems.

In addition to the extraction of fossil fuels, the production of biofuels and electricity from renewable sources such as hydro, wind, solar and geothermal sources can have negative effects on biodiversity.

Still open to debate are the use of nuclear energy and the effects the distribution of energy crops to produce biofuels have on biodiversity, especially following the abolition (Regulation EC 73/2009) of the mandatory set-aside of agricultural land that had become an important shelter for many species, such as wild birds typically found in agricultural environments.

With regard to Renewable Energy Sources (RES), it is known that large hydroelectric plants can have a significant impact on biodiversity. Nonetheless, it is important to stress that in the Italian territory, the suitable sites for large plants were almost already entirely exploited and any remaining use potential can be referred only to small sized plants (mini-hydroelectric), which are also subject to a number of environmental restrictions (for example, limitations on the Minimum Vital Flow).

In recent years, there was also a strong focus on the possible impact of wind power plants on bird life. With regard to this aspect, the impact assessment must necessarily be made on a local scale, or for each site selected for the construction of wind plants during the planning phase.

The impacts on biodiversity in the field of energy vary enormously and no mitigation measure in the energy sector is fully "biodiversity friendly"; however, the best options are represented by:

- solar energy (photovoltaic solar energy, despite the use of land in large scale installations), and solar thermal with a water demand that could be critical in regions with water scarcity;
- wind power, despite the fact that wind power plants could pose a problem for some bird and bat species;
- geothermal energy, even though in the case of large plants fairly significant impacts can be detected, due to the emission of polluting substances; these effects do not occur in low enthalpy geothermal plants.

The threats to biodiversity in this working area can be identified as follows:

- impact of the activity of fossil fuel extraction on the biodiversity of sensitive areas such as wetlands or marine areas of medium-shallow depth;
- consumption of natural areas to host new plants or structures linked to them;
- air, sound, light, water, soil and magnetic pollution;
- effects produced by climatic changes;
- effects produced by the acidification and eutrophication processes and by the tropospheric ozone;
- risk of oil spills and accidents related to shipping oil products;
- reduction of the water flow of waterways subject to exploitation for hydroelectric power at levels that are insufficient for guaranteeing the survival of fish species;
- impact of wind power plants on birds;
- risks for native species related to the diffusion of fast growing allocthonous plant species in the production of biomass for energy use;
- fragmentation of the ecosystems and interruption of the natural ecological corridors for the construction of transmission lines;
- pressure of works connected to energy production on habitats and species.

With regard to the specific objectives:

1. promoting the sustainability of the energy crops, stressing the need to focus on short production chains, with very advantageous energy (and carbon) budgets, that do not cause the loss of biodiversity and soils;
2. identifying mitigation solutions of the impact resulting from the construction and operation of infrastructures;
3. limiting the use of non man-made soil favoring extensions, where possible, of existing infrastructures;
4. preserving natural areas and habitats;
5. integrating energy policies in territorial planning, for assessing all the various different effects on the environmental and biodiversity components;
6. apply the SEA to integrate environmental issues in the drafting of sustainable energy programs;
7. applying the procedures of the landscape report pursuant to Presidential Decree 12/12/2005 for identifying the best solutions for integrating the infrastructures with the surrounding nature and landscape;
8. promoting the mitigation of sound, light, air, soil and magnetic pollution through the identification of mitigation measures that provide green areas and the maintenance/creation of ecological corridors and natural habitats.

The following are priority measures that have been identified:

a) integrating the specific objectives of this Strategy within the National Energy Plan;
b) strengthening governance among the involved institutional bodies;
c) promoting energy efficiency for reducing the consumption of primary sources;
d) assessing the effectiveness of the application:
    i. of the SEA for evaluating the possible effects of implementing plans or programs on biodiversity;
    ii. of the EIA to assess the potential effects that the building of a work, linear and punctual, could have on the habitat and animal and plant species present in a vast area;
    iii. of the VincA (Environmental Effects Assessment) for identifying and assessing possible effects that a project may generate on the habitat and on species of community interest or on the sites of Natura 2000;
e) identifying and distributing the best practices at a national and local level for mitigating and/or compensation solutions of the impact resulting from building and operating structures for energy production.

Measures at an international and European level

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Measures at a national level

In our country, energy is subject to concurrent State-Region legislation: state legislation in principle, and regional legislation in detail. Achieving energy objectives in line with the established European priorities, therefore, requires the shared responsibilities of the Regions and the Local Bodies: to date, however, a shared frame of reference is lacking (for example, a National Energy Plan does not exist) as is coordination between the various institutions. With regard to renewable sources, the "Guidelines for the authorization of the construction and operation of plants producing electricity from renewable sources" (Article 12 Legislative Decree No. 387 of 29/12/03), soon to be approved, will help to establish consistent guidelines from Region to Region for authorization processes. Furthermore, the definition is underway of the regional objectives required for guaranteeing that Italy complies with Directive 2009/28/EC regarding the promotion of the use of energy from renewable sources.

12. Tourism

In the world, in Europe and in Italy, tourism represents one of the most important and growing sectors of the economy that can significantly contribute to achieving the objectives and maintaining high levels of employment growth, of an ethical progress that takes into account the opportunities of each individual to rediscover the value of socialization, of an effective environmental protection and exploitation of natural resources.

In line with the limits of natural, economic, social and cultural resources implicitly considered in economic sustainability, the tourism sector cannot be expanded indefinitely. Nonetheless, through specific strategies, tourist activities can be realigned in such a way as to meet the requirements of sustainability while also representing an important test and multifunctional growth engine, respectful of the natural system to the benefit of future generations.

The challenges for sustainable tourism are linked to the changes in standard consumption patterns that focus in particular on seasonal concentrations, aimed at productive models, namely on the supply chain and of the various different tourist destinations, that are respectful of the territory. In particular, with regard to consumption patterns, tourism development initiatives must strengthen the flow in areas, even in those areas where a strong tourist impact already exists, characterized by sustainable uses related to a high potential of non expressed attractiveness compared to a high potential of attractiveness. A tourist with a sustainable approach and good public and private governance are key factors for changing the standards of eco-tourism.

Sustainable development policies must be increasingly oriented towards integration with values of social tourism; considering the target usually formed by those most attentive to requests deriving from the need of environmental respect, and as mentioned in the 1996 Montreal Declaration of the Bureau International du Tourisme Social, social tourism represents a real and lasting long-term benefit, supporting the principle that it is to be considered a "society shaper", a "factor of economic growth", a "participant in regional planning and social development", as well as a "partner in global development programs".

In this sense, it is necessary to use appropriate marketing strategies and community awareness to point out the interpretations of the traditional concept of tourism. Social, ecological, sports, and nature tourism represent effective aspects and facets of the "umbrella" concept of tourism.

The principal threats to the environment and biological diversity from tourism can be summarized as follows:

- using land for building tourism infrastructures (receptive and catering facilities and other infrastructures such as road networks, airports and ports);
- extraction and use of building materials;

- increased risk of erosion;
- increased fire risk;
- damage, alteration or destruction of ecosystems and habitats due to deforestation, draining of wetlands, and the intensified use of land;
- collecting and using flora and fauna by tourists as well as disturbance of wildlife with influences on behavior, on mortality and reproductive success;
- increasing consumption of primary goods and resources (water, energy);
- deteriorating water quality (drinking water, coastal waters) and eutrophication of aquatic habitats;
- increasing production of solid waste;
- air pollution and production of greenhouse gases, also due to the increase in the demand for mobility;
- noise pollution.

The impacts of a socio-economic and cultural nature must also be taken into consideration, since they are strongly related to the unsustainable use of environmental resources and cause a degradation in the life of the host population or damage to other production activities, such as, for example:

- impact on the indigenous and local communities with loss of their cultural identity and of their traditional lifestyle;
- developing social and intergenerational conflict between tourists and residents;
- deteriorating the landscape.

Tourism can strongly contribute to the achievement of goals of sustainable development, in line with the principles of the Guidelines for Sustainable Tourism of the CBD, by creating the conditions for protecting the territory and being aware of the value of biodiversity.

The main challenge for tourism is to properly manage the activity in order to ensure compliance with the limits of natural resources and of their capacity to regenerate and to ensure a fair and equitable sharing of benefits, with particular reference to the needs of the local population.

Because it is based mainly on environmental, cultural and social quality, tourism might risk becoming economically and socially unsustainable when it causes the deterioration and depletion of the resources that are the source of its profitability.

On the contrary, the sustainable development of tourism is linked to the growth of quality rather than quantity and, consequently, to the activation of types of uses that do not affect the status of nature conservation but, rather, enhance it. The awareness of the quality of tourism represents, therefore, a fundamental prerequisite for the essential development of the sector.

Global trends and priorities change and today, more than ever, tourism must remain competitive while also embracing sustainability and acknowledging that, in the long term, competitiveness depends on sustainability.

The quality of tourism can, therefore, be improved through, inter alia, the renovation of tourist structures and incentives for environmental and quality certification, completion of a working offer in the tourist sector and the development of off-season tourism. These are some of the specific actions aimed at minimizing the environmental impact, and promoting cultural and educational activities.

The specific objectives for this work area have been identified as follows:

1. preventing and minimizing the impact on biodiversity components and on the landscape deriving from tourism and facilitating restorative measures;
2. promoting integration between conservation and the sustainable use of biodiversity and tourism development;
3. providing basic information, also through specific indicators, allowing users to make assessments and informed decisions at every level on the subject of tourism and biodiversity;
4. promoting education, training, information and awareness of sustainable tourism and critical consumption of resources;
5. promoting sustainable tourism keeping in mind the national image in global markets, developing biodiversity, the resources and the characteristics of the different geographical areas.

The following priority measures have been identified:

a) promoting sustainable tourism also through integration with other economic activities;
b) promoting the application of existing legal instruments and regulations, reviewing them if necessary or developing new instruments with greater effectiveness for encouraging types of quality tourism;
c) promoting respect for the integrity of local cultures while enhancing the role of local communities in tourism;
d) supporting the strategic use of rural areas and typical marginal economies in a tourist framework of an integrated rural development and of territorial vocation;
e) building and strengthening the skills of tour operators in the field of sustainable tourism;
f) improving the system of protected areas and encouraging the role of good laboratory practices for a sustainable management of tourism in favor of biodiversity;
g) strengthening incentive mechanisms for the development of sustainable tourism;
h) identifying a set of indicators for monitoring tourism impact on biodiversity;
i) identifying indicators of sustainable tourism development shared nationally and regionally to be applied for planning measures financed by the public and private sectors;
j) disseminating and distributing the knowledge of national and local best practices for sustainable tourism, also by creating an online database that also allows an exchange of experiences;
k) promoting a national network of soft mobility having as basic requirements the recovery of discarded territorial infrastructures (railways, roads, embankments, tracks etc.), compati-

bility and integration between various users, separation or protection from ordinary road networks, integration with the local public transportation system and with the widespread hospitality network;

l) supporting the adoption and distribution of environmental management systems (EMAS, ISO 14001) and promoting eco-environmental brands (ECOLABEL, national quality brands, brands promoted by protected areas);

m) adopting the web portal NaturaItalia, developed by the MATTM, as a national infrastructure for the promotion and marketing of environmental tourism for the sustainable exploitation of the nation's natural heritage formed by Biodiversity and by the Protected Natural Areas;

n) promoting and increasing the development and use of existing eco-friendly policies or those presently being identified, such as ones associated with typical food or wine products (the oil road, the wine road), with historical aspects (for example, the Francigena way) or having religious connotations (the road of Saint Francis), also used as a tool to disseminate biodiversity values.

Measures at an international and European level

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Measures at a national level

Law No. 135 of March 29, 2001, "Reform of national tourism legislation" recognizes the strategic role of tourism for the economic and labor development of the country in an international and European Union context, for the cultural and social growth of the individual and the community, favoring relations between different populations and the importance of the protection and enhancement of environmental resources, of cultural heritage and of local traditions, also for developing sustainable tourism.

The reform of Title V of the 2003 Constitution established, among other things, the exclusive competence of the regions on tourism.

During the "Second International Conference on Sustainable Tourism", that was held in Rimini in November 2008, promoted by the Province of Rimini in collaboration with the World Tourism Organization (UNWTO), the European Commission, the Presidency of the Council of Ministers – Department for the Development and Competitiveness of Tourism, the Ministry for the Environment, Land and Sea together with ICLEI (International Council for Local Environmental Initiatives)- Local Governments for Sustainability, the "Second Charter for Sustainable tourism" was approved, known as the "Charter of Rimini", that validates the Aalborg Commitments of 2004 with reference to sustainable tourism and adopts the guidelines of the World Tourism Organization for developing sustainable tourism; in particular, among other things, the

need was stressed for the best use of environmental resources that represent a key element for the development of tourism, protecting the maintenance of essential ecological processes and helping to preserve natural heritage and biodiversity.

The Charter identifies and extends the concept of sustainable tourism in new ways, also in light of the international debate on the topic: it indeed emphasizes the importance of the sustainability of the relation between "tourist versus resident cities" in order to safeguard the quality of life and employment in tourist areas by protecting:

- environmental assets (resources: water, land, air, energy sources) by minimizing the impacts of the waste materials and transportation, promoting urban redevelopment and a more widespread use of green building, promoting territorial integration at the tourist district level and encouraging the development of ecological networks and short production chains in relation to the local production of quality;
- cultural heritage (social and human capital), developing a local identity and hospitality culture;
- work quality, promoting "good employment", social dialogue and the participatory processes of development;
- economic welfare and the quality of life of the local communities;

with the ultimate goal of promoting the territory's economic competitiveness and relying on the quality of tourism products and processes.

Since 2001, some important Italian cities have become members of the International Network of Cities for Sustainable Tourism. The partners of the Network, whose activities are coordinated by ICLEI, are local governments of European Community members and Mediterranean countries where mass tourism plays an important role in their local economy. The Network's principal objectives are: developing and implementing joint projects aimed at promoting tourism sustainability; creating policies and best practices for sustainable tourism and exchanging information and experiences.

Within the WTO (World Tourism Organization), Italy has been hosting since November 2008 the Permanent Secretariat of the World Committee for Ethics in Tourism, whose main task is to promote awareness and the dissemination of the Global Code of Ethics for Tourism. The Code approved by the General Assembly of the United Nations in 2001 is aimed at all players in the tourism sector and has the goal of minimizing the negative impact of tourism on the environment and artistic heritage, while optimizing the implications of tourist locations (Article 3) in terms of sustainable development for residents. A global scale communication strategy is presently being examined.

13. Research and Innovation

Research and innovative technology are important tools when applied to the environment for helping to join economic development and environmental compatibility: both may allow undertaking new initiatives for protecting non-renewable environmental resources and for spreading more environmentally acceptable production models.

The need for scientific research that is the foundation and basis for the advancement of knowledge aimed at understanding the complex mechanisms that regulate ecosystems and their protection, both for designing and developing innovative methods for analyzing, monitoring and enhancing biodiversity, is now fully accepted.

In COM (2006) 216, Objective A10 is identified and states "Substantially strengthen the basic knowledge for the conservation and sustainable use of biodiversity, within the European Union and the world". The need for a basic research is therefore emphasized, since the knowledge of the organisms, of their biology and ecology is also appropriate for defining their status of conservation and the threats to which they are subjected. The importance of taxonomic studies has been highlighted also by the Conference of the Parties of the CBD with the GTI that envisages developing a species information system.

In the COM (2010) 4 research is handed the task of "filling the gaps in terms of knowledge".

The specific objectives to be achieved by the year 2020 for this work area are included in the Carta di Siracusa on Biodiversity:

1. *"[…] Continuing the process of exploring mechanisms to improve the science - policy interface for biodiversity and for ecosystem services for conservation and sustainable use of biodiversity, long-term human well-being and sustainable development, taking into account the special need to develop and maintain the technical and scientific capacity of developing countries in biodiversity-related issues [omissis].*
2. *Supporting cooperation among countries, relevant international organizations, research institutes and the NGOs to further global monitoring of biodiversity, building upon the effective networking of existing monitoring schemes.*
3. *Collecting data on biodiversity, including those relating to suitable human welfare indicators: indicators that are reliable, comparable and interoperable, and developing global approaches to exchange scientific knowledge, best practice, technologies and innovation, based on existing organizations, centers and mechanisms.*
4. *Fostering comprehensive and focused research and capacity building, at all levels, on biodiversity and ecosystem services, taking into account different capabilities of countries and improving the development and wide use of advanced technologies to carry out monitoring of biodiversity changes and global environmental assessment […]".*

The following priority measures have been identified:

a) developing the "National Network of Biodiversity" as the Italian network of research centers and infrastructures capable of gathering, sharing, improving and spreading knowledge on the various different biodiversity components and on those processes that affect their conservation by 2013;
b) intensifying research on the status, trend and distribution of habitats and species of conservation interest and organizing adequate and constant monitoring activities;
c) intensifying research on the most significant threats to biodiversity by developing and testing preventive and mitigating measures;
d) defining and validating the knowledge and assessment methods for the genetic heritage of the local varieties and breeds/livestock of limited animal population through genetic markers;
e) studying new conservation models of plant and animal populations that are subject to genetic erosion in order to guarantee the survival of the population, maintaining an adequate genetic variability and also limiting management costs of conservation programs;
f) studying the potential for adapting and resisting to new emerging pathologies (plant or animal) of the local plant varieties and livestock breeds of animals risking genetic erosion;
g) developing and applying methods for measuring and improving the effectiveness of the relevant policy measures for preserving and sustainably using biodiversity;
h) assigning adequate financial resources to biodiversity research and to spreading its results;
i) implementing institutional arrangements for guaranteeing that relevant research for different policies are conducted (i.e., supporting the directives on nature, the integration of biodiversity into sector policies);
j) increasing the capacity for integrating research results in developing sector policies;
k) establishing and promoting common standards of data and quality assurance procedures that allow the interoperability of databases and key inventories on biodiversity;
l) establishing and promoting the preparation of an inventory on the know-how and traditional technologies for their maintenance and, when necessary, for their reproduction with modern technologies that are attentive to sustainability values and requirements;
m) promoting the periodic review of environmental research programs based on the needs and priorities of ongoing developing research;
n) organizing forums for promoting effective dissemination of research results and of the best practices for biodiversity;
o) guaranteeing that environmental issues continue to have a prominent role in regional and local research programs;
p) supporting and coordinating activities for the continuous and organic genetic and functional characterization (environmental, agronomic, nutritional, nutraceutical, pharmaco-

logical, industrial) of the wealth of available genetic resources and of the relative bioinformatics applications;

q) operating for coordination in finding genetic resources, their conservation and management in the existing collections also, and above all, through international agreements.

Measures at an international and European level

[*omissis*]

Measures at a national level

At a national level, with regard to environmental and geographical information systems, the National Institute for Environmental Protection and Research (ISPRA, formerly APAT) manages the SINAnet network which manages a network of environmental information produced by the Regions and by ARPA (the Regional Agency for Environment Protection) based on the activities of the PFR (Regional Focal Points). From an institutional and regulatory point of view, it is important to remember that the State-Region Agreement on the Geographic Reference System (GIS Agreement of 1996) has defined, in compliance with the ISO TC 211 specifics, the standards for the construction of the Topocartographic Database. The subsequent Legislative Decree No. 82 dated March 7, 2005 and its amendments "Code of digital administration" provided for the Committee for the technical rules on territorial data of the public administration established at DigitPA (formerly C.N.I.P.A.) - and the recent Legislative Decree No. 32 dated January 27, 2010, implementation and transposition of the Directive 2007/2/CE (INSPIRE) - established the Nation State for territorial and environmental information. It should be emphasized that Legislative Decree 32/2010 provides as a reference infrastructure the National Geoportal that replaces for all purposes the cooperative mapping System – the National Cartogeographic Portal of the MATTM.

At a regional level, through resolutions of the different Regional Governments, the Regional Focal Points of the National Environmental Information System have been designated.

Environmental monitoring data are provided by the regional PFR upon delivery to the Ministry of specific data for preserving nature and biodiversity.

The establishment in some regions of Regional Observatories for biodiversity contributes to the collection and organization of this data supplied both through the PFR and the SINAnet network and directly to the Directorate of Nature Protection of the MATTM.

With regard to the knowledge of Italian biodiversity, one of the principal obstacles encountered was that of assembling existing data from various different sources throughout the territory (academic, agency, public, private, local and central). For overcoming the critical completion and systemization of knowledge in 2005, the Directorate of Nature Protection of the

MATTM, as National Focal Point of CBD, commissioned the publication of the volume "Status of Biodiversity in Italy – Contribution to the National Strategy for Biodiversity". This report was written by researchers and experts (botanists, zoologists, foresters, etc.) and reported the status and trends of Biodiversity in Italy providing a scenario summary in compliance with the ecosystem approach.

The same year, the CD "GIS Natura" was also produced including maps and databases of national importance. In addition to these two cognitive tools, as part of the implementation of the 2010 Objectives identified in the CBD Strategic Plan, as of 2005, further efforts were made and in-depth knowledge was obtained and provided on thematic and taxonomic distribution of animal and plant species, the identification of communities, habitats and landscapes with the double objective of fulfilling the requirements of the European Commission through the COM (2006) 216 and refining national and local knowledge in order to produce adequate tools for identifying national objectives.

In 2005-2006, the MATTM and the Committee of Ministers for the Information Society (CMSI) at the Presidency of the Council of Ministers, co-financed the feasibility study and the start-up of the "2010 Environmental System" as a major project for digital innovation for the country for protecting nature with reference to biodiversity and to the protected natural areas. In 2009, the project's implementation was launched aiming at achieving the following two integrated measures for supporting the national policies of this sector:

- the NNB (Network Nazionale per la Biodiversità - National Biodiversity Network - NBN) for the collection, coordination and production, according to standard and certified methods, of the knowledge and transfer of techno-scientific know-how;
- the NaturaItalia Portal for the promotion and online dissemination of contents and innovative digital services dedicated to public operators (central and local Public Administration, scientific and educational communities) and private bodies (companies, associations, general public), that could also transmit the activities and data coming from the NBN.

The qualifying objectives of the entire System are as follows:

- creating an advanced technological infrastructure at a national level (shared with the MATTM and URP institutional sites and online, in line with the European INSPIRE Directives, interfaced with the Ministry's National Cartographic Portal (future national GeoPortal) and interoperable with similar international infrastructures (LifeWatch, GBIF, etc.);
- rendering available through the Biodiversity thematic Areas and on the Protected Areas of the NaturaItalia Portal, information contents (multimedia, Multilanguage, chrono and geo-referenced) and value-added data (standardized and certified) published in multichannels according to Web 2.0 (Community and Social Network) and a series of

advanced digital services (e-booking, e-ticketing, e-commerce, e-learning, e-government);

- forming a network of bodies for establishing a national system of partnership between the Public Administration and scientific world for producing, managing and using thematic knowledge (aimed at monitoring and reporting on Biodiversity provided by the European Directives and by international Convention), that could generate resources to reinvest in the sector, on the basis of a specific techno-economic sustainability Plan;
- creating the Clearing House Mechanism (CHM) required by the CBD and by the European Union for promoting knowledge, responsibility and consent from the general public, actively involving qualified bodies in the territory and different users in the production of information content and providing them with digital instruments aimed at controlling the territory and formulating environmental complaints;
- creating a training channel of environmental education and global communication in line with modern information technologies."

The 2010-2012 PNR (National Research Program) (is a body for the coordinated development of research activities. The implementation instruments exist already, or will be activated by the various Ministries and Regions. The objective, in the terms of the PNR, is to create national measures coordination as a result of a shared identification of their institutional role. The PNR adopts an innovative approach where there is no interruption between public and private research, between knowledge driven research and applied research. In the previous PNR, integration between public and private research was suggested: the public-private laboratories, the enhancement of high technology districts and support for large strategic research programs.

With the evolution of national legislation for the financing of "Research of Relevant National Interest", the MIUR (Italian Ministry of Education, University and Research) launched a new mechanism of allocation of funds, based on precise qualifying points and requirements: co-financing, group research and the principle of assessment of the research projects. These are the Research Programs of Relevant National Interest (PRIN) that provide free and independent research proposals without reporting requirements of default issues at a central level. The PRIN favor proposals that integrate various expertise and contributions from different Universities. Applied research focuses on proposals that highlight particular interests towards potential users of the results.

The PTNM (National Maritime Technology Platform) arises from the awareness that competitiveness and sustainability represent Italy's development objectives and that investing in knowledge and expertise is one of the keys to success in this direction.

The PTNM refers to European experience that demonstrates how the technology platforms are the ideal instrument for organizing widespread players for achieving these goals.

The PTNM involves all of the players of the national sea system (economic, scientific or institutional), with the objective of consolidating the network of relations, sharing a vision of

the sector in the subject of technological growth, and developing initiatives of national importance.

As part of this context, the PTNM anticipates and confirms the criteria established by the European Commission's Blue Book for "An integrated maritime policy for the EU" and offers an interface with respect to the WATERBORNETP European platform.

The mission of the PTNM is to:

- establish ongoing dialogue for innovation between the institutional (central and regional) and industrial players in the sector of Italian seas;
- contribute to creating the widest consensus possible on these issues and focusing on the available efforts and financial resources (private, regional, national and community);
- develop, on the basis of documents produced by the WATERBORNETP, the Italian versions of the medium-long term Vision and of the Research Strategic Agenda;
- propose initiatives with regard to research and innovation, providing a response to the economic expectations of the sector, guaranteeing both high levels of security and environmental respect;
- support education and training activities aimed at maintaining the highest level of competence and expertise in the sector.

The PTNM has undertaken its own path actively involving the economic players, the system of public and private research, and the central administrations, in order to develop an effective mechanism of research coordination and innovation as well as the conditions for effectively cooperating with the players within the European Union. On this basis, the PTNM has provided for:

- developing the national Strategic Research Agenda (SRA) that, characterizing from an Italian viewpoint the SRA produced by the WATERBORNETP, defines objectives and targets for the sector and provides actions of networking and synergy creation;
- defining a proposal for a national research program for the sea (RITMARE Initiative) and a set of proposals for demonstrative projects of national importance both in the areas of technology and training;
- the coordination of the sector with reference to the 2015 Industry Program.

As a main requirement, the PTNM has presently begun a process of extending its position as the sector's reference contact and for proactively interfacing with the Regions.

14. Education, information, communication and participation

Education, information and communication in the environmental field presently play a peculiarly important role, together with the increased seriousness of environmental issues and with the awareness of the complexity of solutions, the need has developed for informing the community on these topics to sensitize them, while also contributing to increasing awareness, as well as individual and collective responsibilities. The objective of informing as to what biodiversity is, the complex system of environmental, economic, social and cultural relations that determine its loss or its conservation, allowing each one of us to make decisions and behave in a culturally appropriate way that is also locally significant for its actual conservation, requires developing a set of values, attitudes and competence.

This vision of education implies a reorientation and new direction of education systems, of policies and practices focusing mainly on:

- promoting and developing basic education;
- revising school programs from early childhood schooling to university;
- permanently educating adults;
- the widespread educating of communities;
- training educators and advanced training;
- organizing a network of national and local educational and training staff that operate in an integrated manner;
- studying and defining a system of quality indicators.

Moreover, since the value and culture of biodiversity are topics that must permeate all of society transversally, in addition to policies and action aimed at schools and adults, it is necessary to recover the topic of culture in a broader sense, involving in various ways the production and economic sectors of society, starting from information and training of specific professional categories (fishermen, farmers, breeders, businessmen, builders, planners, etc.).

In Italy, a tradition exists in the field of environmental education that actively involves a myriad of individuals and structures both in the public and private social sectors that form a starting base to be enhanced, while also guaranteeing national coordination.

Education, information and communication on environmental topics represent one of the pivotal points of Governance for policies and for community development programs, since, among other things, they concern one of the individual's principal rights: the right to health and to the quality of life.

Individually, citizens make decisions every day that can directly or indirectly impact the environment: better quality environmental information that is more easily accessible will con-

tribute to create an awareness among the population and influence conduct and behavior patterns.

The communities and the local social and economic players play a fundamental role in identifying and implementing the necessary action for reaching the specific objectives identified in the work area defined by the Strategy.

The importance of the theme of participation of local communities in defining and implementing programs for preserving biodiversity is witnessed by the explicit reference to this topic in many decisions made by the COP (Conference of the Parties) of the CBD. The actual elaboration of the eco-systemic approach as a general method for implementing the Convention sees the human community as an integral part of ecosystems and of the mechanisms regulating them. It attributes special importance to the role of local communities and to the traditional knowledge in defining and implementing strategies and programs for preserving biodiversity.

The topic of participation, of accessing information and environmental communication represent an increasingly present point of reference within the international, community and national rules and programs for sustainable development. It is clear that in order to effectively face environmental problems and pursue sustainable economic and social development capable of preserving the environment we live in and guaranteeing it to future generations, government and administrations must inform and involve the community in decisions involving the territory and the quality of life.

There is a close inter-dependence between environmental protection needs and the right to information: more than any other good or value, the environment requires proper circulation of information and knowledge, also of a technical nature, in order to properly define the objectives and modalities of protection and conservation.

In order to ensure attaining the objectives identified in the Action Plan "Beyond 2010", the European Commission has identified four main measures, the fourth of which includes education, awareness and participation of the public in biodiversity.

Criticalities in these work areas can be summarized as follows:

- difficulty in environmental education and information on what exactly biodiversity is, increasing the awareness of its intrinsic value, of its functions and of its economic value;
- inadequacy of environmental education in orienting toward the complexity of the relationship man-environment (environmental education aimed at sustainability must facilitate understanding the complex relations that interconnect anthropogenic, individual and collective action with the ecosystems at the local and global level);
- scarce capacity for creating changes in habits and in firmly rooted conduct and behavior;

- difficulty in developing critical thinking and lack of an active and responsible community with respect to biodiversity;
- scarce synergy and coordination between individuals/systems operating in the sector;
- scarce effectiveness of communication and dissemination of the topic with particular reference to resolving conflicts between the need for preserving biodiversity, the ecosystem services and the economic development of local communities;
- lack of contents regarding the knowledge, conservation and sustainable use of biodiversity in scholastic curricula;
- lack of educational projects (both formal and non) structured with a multidisciplinary/transversal approach (not only scientific, but also cultural, emotional, aesthetic);
- lack of tested systems of quality indicators for assessing the effectiveness of educational measures.

The following represent the specific objectives:

1. rendering the information on the value of biodiversity clear, accessible and comprehensible to all;
2. strengthening the role of education, information and communication as factors required for creating an awareness and perception of environmental issues in general and of the objectives included in this Strategy in particular:
3. improving specific training of educators;
4. encouraging an exchange and sharing of good practices among individuals operating in the field of environmental sustainability education and preserving biodiversity;
5. re-orienting educational initiatives toward change and developing critical thinking toward biodiversity also by encouraging the adoption of responsible behavior;
6. improving the level of information, training and awareness of political decision-makers and of administrators regarding the importance of biodiversity;
7. including biodiversity in school curricula as a sustainability aspect, both within the already existing subjects, and in interdisciplinary areas and within projects;
8. promoting the use of shared processes as key tools for preserving biodiversity.

Priority measures to be implemented concern creating and promoting:

a. collaboration and synergy among institutional bodies interested in including the topic of sustainability, particularly biodiversity, in formal education;
b. training for educators;
c. educational initiatives also through the use of innovative methods;
d. initiatives for encouraging coordination among bodies in sustainability education;
e. informative materials for communities for promoting the spread of good practices for preserving biodiversity;
f. research and surveys for monitoring and assessing the population's awareness level;
g. national and local communication campaigns;

h. informative infrastructures and network development on biodiversity, with particular reference to the Naturitalia Portal and to the NBN (National Biodiversity Network);
i. preserving the cultural heritage of local communities and shared management of environmental resources.

Measures at an international and European level

[*omissis*]

Measures at a national level

The right to access environmental information was ratified for the first time in Italy with the establishment of the Ministry for the Environment to which Law no. 349/86 assigned the institutional role of coordinating and promoting activities regarding environmental education, information and training while also focusing on the important role played by the collaboration with the Ministry for Public Education.

Article 14, paragraph 3, of Law No. 349/86 established that that "*every citizen has the right to access information available on the status of the environment in compliance with the existing laws, at the offices of the public administration…* [*omissis*]".

The right to environmental information established by Law No. 349/86 is differentiated from the more general right to access administrative documents, established by Law No. 142/90 and its subsequent amendments and integrations, since it is not only reserved to the parties involved in proceedings, but extended to any citizen.

Legislative Decree No. 39 dated February 24, 1997 implemented the Community principles for accessing environmental information of the above-mentioned Directive 90/313; this decree has derogated from the general discipline of the access right as established by Law 241/1990, both objectively and subjectively, freeing it from a particular legitimizing position of the requestor, assuming, owing to the particular importance of the good in question, the prevalence of interest in the information of environmental conditions, thus allowing the widespread control of these goods.

Consequently, the right to access was granted to whoever intended to exercise this right, excluding any type of selection. It is, therefore, a "perfect subjective right" that may be exercised by any individual independently of any particular qualifications and legitimization conditions.

Directive 2003/4 on public accessing environmental information was applied nationally by Legislative Decree No. 195 dated August 19, 2005. The new Legislative Decree implemented a sort of revolution regarding the Public Administration that was no longer seen as a passive supplier of information, but became the disseminator of such information.

Along with Article 3 regarding accessing environmental information upon request, provisions were added regarding the distribution and dissemination of environmental information as established by Article 8. In establishing the general principles regarding environmental information, Legislative Decree 195/2005, in compliance with Article 1 intended "guaranteeing the right for accessing environmental information held by the public authorities" establishing its terms, fundamental conditions and the modalities for exercising this right.

In protecting the right for accessing environmental information, communication technology is a fundamental tool for establishing the terms, basic conditions and practical modalities for exercising the right and for guaranteeing that environmental information is systematically and progressively made available to the public and is disseminated. Public authorities (state, regional, local, public, etc. administrations) as well as each physical or juridical person that carries out public functions regarding environmental issues or who exercises administrative responsibilities under the control of a public body, are called, in addition to managing the requests of those interested based on the exercising of this right, to render available the environmental information held that is relevant to the purposes of its institutional activities.

Data banks are considered essential among the tools required for disseminating the environmental information as established in the above-mentioned decree. Public authorities must establish a plan for rendering environmental information progressively available in electronic databanks that are easily accessible to the public through public communication networks to be annually updated and available on the internet site. Environmental information must also be made available by creating connections to information systems and to electronic data banks, also managed by other public authorities easily accessed by the public.

The objectives of developing and progressively distributing computerized and automated information in the Public Administration include, in addition to activity aimed at data sharing, the integration of available information at various government levels for increasing the efficiency of the flow of information. One of the results of this action is represented by the SIT (Sistemi Informativi Territoriali – Territorial Information Systems), that allow both managing, elaborating and distributing information geo-referenced directly or indirectly, as well as creating integrated data banks, equipped with infrastructural services for exchanging and sharing territorial information (Legislative Decree 82/2005). Re-utilizing public information by private citizens (Directive 2003/98/EC applied with Legislative Decree 36/2004) should be regulated by a coordinated set of rules.

With regard to environmental education, in Italy there are many networks that contribute to sharing experiences and to building relations and partnerships both nationally and locally,

such as the INFEA system with its territorial organizations (LEA, CEA), the National Coordination of the local Agendas 21, the Parks and Protected Areas networks and Environmental Associations.

Within this context, implementing the DESS (International Decade of Education for sustainable Development) Strategy continues through the coordination activity conducted by the UNESCO Italian national Commission supported by the National Committee, to which many institutional bodies belong as well as independent ones (MATTM, MIUR, ISPRA –and the 21 ARPA/APPA, regional school offices, Bodies, networks and Associations). In this context, the following are a fundamental part of this project:

- the Charter of the principles for environmental education drafted in Fiuggi in 1997 by the Ministry for the Environment and Public Education;
- the 1st National Conference on Environmental Education (Genoa, 2000).

15. Italy and global biodiversity

Biodiversity is a common good whose integrity is essential for reducing poverty and for guaranteeing firm and defined development projects for poorer countries. Three quarters of the billion people that survive on less than one dollar a day live principally in rural areas and base their livelihood on natural resources and on ecosystem services, and they are the ones that suffer the most from environmental deterioration and the loss of biodiversity.

The connections between biodiversity and poverty are much more complex and dynamic than the inter-dependence existing between rich and poor countries. Based *on the Millennium Development Goals and on the Countdown 2010,* a vast potential synergy exists among the objectives regarding biodiversity and sustainable development established internationally.

Each country's international responsibility and commitments can "strategically" affect the protection of biodiversity in developing countries by improving international governance to include, within a globally responsible framework, the impacts of national policies and action on the biodiversity of third countries.

In order to achieve this improvement, it is essential to promote coherence among Italian policies on issues regarding development cooperation, international trade and utilization of natural resources of third countries. This is what is discussed in the work areas of this Strategy.

The areas of development cooperation that involve biodiversity are particularly the topics of distribution of knowledge and of bio-safety for what regards transferring GMOs from one country to another, agro-biodiversity and equal benefit sharing deriving from the use of genetic resources and of nutritional safety, topics that are all discussed in their respective work areas.

Our country's commitment for reaching the objective of eradicating poverty materializes in international cooperation projects, particularly with the countries that do not belong to the European Union, with which we intend to contribute to preserve biodiversity through:

- preservation and sustainable use of eco-systems and habitats that are characterized by a high level of diversity, are inhabited by a vast number of endemic species, threatened or migratory, representing basic evolutionary processes or other biologic processes, having a social, economic, cultural or scientific importance;
- supporting the managing of protected areas, aimed at improving management capacity, promoting shared management approaches, developing compatible economic activities in the same areas or in neighboring areas;
- preserving threatened species and communities, or those having medicinal, agricultural, forestry, etc. value;
- preserving types of genomes and genes of social, scientific or economic importance;
- equally distributing benefits deriving from the use of genetic resources;

- protecting migratory species, even by promoting protected areas or sanctuaries in international waters shared among various different countries and using ecologically protected areas beyond the "country's territorial waters" (Law No. 61/2006).

As part of these projects, Italy has implemented many "best practices" whose results represent an interesting and effective example to be followed by enhancing, strengthening and expanding them also to other similar contexts.

Strengthening Italy's international image on preserving biodiversity is necessary also as part of providing a new impetus to the role of the European Community for guaranteeing greater synergy and coherence among the measures for governance, international exchanges (including bilateral agreements) and cooperation for development.

This commitment, to be manifested also through strengthening and increasing financing for biodiversity, would represent a more effective and significant contribution in implementing the CBD and its relative Protocols.

In view of the above, it is essential to sensitize both public and private companies that operate in third countries in order for them to consider in planning and implementing their activities aimed at preserving biodiversity, their ecological integrity and consequently, the small scale community economies that depend on functional eco-systems.

These activities mainly take place in developing countries and are generally linked with energy production sectors (dams, deviation of waterways, agro-fuel), with raw materials trade as well as agriculture and breeding with serious consequences in terms of hydrologic cycle alteration, deforestation, and soil contamination. This can also inevitably generate potential conflicts owing to different interests for using scarce resources, such as water, for example.

It is, therefore, necessary to support adopting a code of conduct that guarantees ecological integrity in projects and in measures to be implemented, as part of international cooperation.

All the expected initiatives are also conducted within the context of offering new knowledge and new sustainable development tools to be integrated (and not replaced) with culture, traditions, habits and the activities of indigenous populations that are respectful of biodiversity in all of its aspects.

By 2020, the specific objectives established by the European Action Plan must aim at:

1. strengthening the effectiveness of international governance for biodiversity and the ecosystem services in order to pursue the effective global implementation of the CBD and integrating biodiversity in global processes;
2. increasing in real terms the financial resources intended for projects that directly support biodiversity, also through the general contribution for biodiversity of the member states of the European Union through a substantial 4th Consolidation of the Global Environment Facility (GEF);

3. drastically reducing the impact of the measures and of the international exchanges on biodiversity and the ecosystem services globally, based on identifying and assessing the principal effects of such activities on the biodiversity of third countries.

Priority measures have been identified as follows:

a) intensifying initiatives regarding biodiversity in cooperation projects, also through promoting sustainable rural development, strengthening local communities and recognizing the rights of indigenous populations;
b) promoting integration of biodiversity into the policies of partner countries;
c) increasing the consideration of protecting biodiversity as part of interaction with partner countries;
d) improving coherence with the objectives of this Strategy of policies and of economic agreements that do not specifically focus on biodiversity, particularly those for development and commerce;
e) strengthening the complementary nature between cooperation and development of Italy and of the European Union as well as preserving biodiversity;
f) defining verification tools for including biodiversity in development cooperation;
g) applying the Strategic Environmental Assessment of programs and strategies and the Environmental Impact Assessment of projects financed by Italy in third countries;
h) strengthening the commitment for improving equal access to genetic resources and the fair and equitable sharing of benefits arising from their utilization (ABS);
i) promoting consumer awareness with respect to the impact of various product consumer habits in terms of biodiversity impact in other countries;
j) promoting training of co-operators with respect to biodiversity issues as well as of conservation operators in developing countries (DC).

Measures

The general objectives of development cooperation are established in the community and multilateral framework. In the multilateral field, the principal point of reference is represented by the "Millennium Declaration", approved in 2000 during the Special Session of the UN General Assembly that sets the central objective of halving absolute poverty by 2015. This objective is divided into eight points (Millennium Goals), based on international cooperation and among which, in point 7, environmental protection.

"Biodiversity for development" is one of the transversal themes of the seven major work programs established by the CBD and the "Biodiversity for Development Initiative" was launched within the COP9 (Conference of the Parties 9) with the fundamental purpose of promoting the integration of biodiversity within sectoral policies and strategies.

Internationally, through mandatory, voluntary and technical support, Italy supports both the principal international agencies and organizations that are active on environmental protec-

tion issues (such as UNEP, FAO, IUCN), and the financial support tools for implementing the Rio Convention and other multilateral agreements (for example, Global Environment Facility, IFAD, Global Mechanism to Combat Desertification), which all develop, among other things, action that is directly aimed at protecting biodiversity or having positive implications and effects in this sense.

The European framework is an essential point of reference for Italian cooperation since, even if aid given by the Commission is classified internationally (Ocse/Dac) as being multilateral, for certain aspects it is more similar to bilateral aid. Nearly one third of Italian public aid for development is channelled through the European Commission for two distinctive goals:

- as a national share owed to the European Development Fund (Fes/Fed), for financing activities included in the new Acp-EU agreement of 2000;
- as Italy's contribution (approximately 13%) for ordinary activities included in the community budget for development aid.

The European Union has undertaken ambitious commitments in economic cooperation for development, starting from the commitment taken in 2001 at the Goteborg Council in which the EU undertook to halt the loss of biodiversity by 2010. Crucial steps were taken by the "Malahide Message " in 2004, specifically (objective 11) for economic cooperation and development aid, by the "Paris Message", adopted in 2006 by the Conference on biodiversity in European development cooperation and by the COM(2006) 216, which stated the need for increasing financing for biodiversity and for strengthening action that includes biodiversity within the development aid area.

With regard to reducing the impact of international exchanges, the CITES represents a fundamental tool for controlling the trade of wild species. Moreover, within the European Union, through the FLEFT Regulation, the problem of the impact resulting from trading tropical forest wood is being faced and integration is being promoted of the environmental aspects in international exchanges through the Sustainability Impact Assessment Program (SIA) of the Commission relative to the trade that includes a number of sector studies (i.e., agriculture, forests and forest products, as well as fishing zones) as part of the multilateral agreements (WTO, negotiations underway on the Agenda for the Development of Doha) and/or of regional/bilateral agreements for free exchange (i.e., EPA with ACP Countries).

Through various channels and modalities used for implementing public aid initiatives for development (bilateral, multilateral, multi-bilateral, various types of partnerships, programs promoted by the NGOs etc.) Italy supports activities and projects directly aimed at preserving natural resources and biodiversity.

Italian cooperation with developing countries is presently regulated by Law No. 49 dated 26/2/1987 and by the relative implementation of: DPR No. 177 dated 12/4/1988. Law

49/87 defines the NGOs that are suitable for managing cooperation projects following highly selective research carried out by the Ministry of Foreign Affairs.

Annex I

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Annex II

Essential Bibliography

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Glossare

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Essential webbliography

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Abbreviations

ABS	*Access and Benefit Sharing*
ACCOMBAS	*Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area*
AEWA	*African-Eurasian Waterbirds Agreement*
A.P.	*Autonomous Provinces*
ARPA	*Agenzia Regionale per l'Ambiente* (Regional Agency for Environment Protection)
ASCI	*Areas of Special Conservation Interest*
ATO	*Ambito Territoriale Ottimale* (Optimal Territorial Area)

CAMP	*Coastal Area Management Programme*
CAP	*Common Agricultural Policy*
CBD	*Convention on Biological Diversity*
CCD	*Convention to Combat Desertification*
CFP	*Common Fisheries Policy*
CGIAR	*Consultative Group on Intemational Agricultural Research*
CHM	*Clearing-House Mechanism*
CIPE	*Comitato Interministeriale per la Programmazione Economica* (Inter-ministerial Committee for Economic Planning)
CITES	*Convention on Intemational Trade in Endangered Species of Wild Fauna and Flora*
CMS	*Convention on the Conservation of Migratory Species of Wild Animals*
CMSI	*Comitato dei Ministri per Società dell'Informazione* (Committee of Ministers for the Information Society)
CNR	*Consiglio Nazionale delle Ricerche* (National Research Council)
COM	*Communication from the European Commission*
COP	*Conference of the Parties*
CRA	*Consiglio per la Ricerca e la sperimentazione in Agricoltura (*Agricultural Research Council)
CWRSG	*Crop Wild Relative Specialist Group*
DESS	*International Decade of Education for Sustainable Development*
D.L.vo	*Decreto Legislativo* (Legislative Decree)
D.M.	*Decreto Ministeriale* (Ministerial Decree)
D.P.C.M.	*Decreto del Presidente del Consiglio dei Ministri* (Prime Minister Decree)
D.P.R.	*Decreto del Presidente della Repubblica* (Presidential Decree)
ECP/GR	*European Cooperative Programme on Genetic Resources*
EEA	*European Environmental Agency*
EFF	*European Fisheries Fund*
EIA	*Environmental Impact Assessment*
ENEA	*Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile* (Italian National Agency for New Technolo gies, Energy and Sustainable Economic Development)
EPCS	*European Plant Conservation Strategy*
EPZ	*Ecological Protection Zones*
EU	*European Union*
EUAP	*Elenco Ufficiale delle Aree Protette* (Official List of Protected Areas)
EUROBAT	*Agreement on the Conservation of Bats in Europe*
FLEGT	*Forest Law Enforcement, Governance and Trade*
FSC	*Forest Stewardship Council*

GBIF	*Global Biodiversity Information Facility*
GEF	*Global Environment Facility*
GMO	*Genetically Modified Organisms*
GSPC	*Global Strategy for Plant Conservation*
GTI	*Global Taxonomy Initiative*
IAS	*Invasive Alien Species*
INFC	*Inventario Nazionale delle Foreste e dei Serbatoi forestali del Carbonio* (National Inventory of Forests and Forest Carbon Sinks)
ICLEI	*International Council for Local Environmental Initiatives*
ICZM	*Integrated Coastal Zone Management*
IMP	*European Integrated Maritime Policy*
INSPIRE	*Infrastructure for Spatial Information in Europe*
IPCC	*Intergovernmental Panel on Climate Change*
IPGRI	*International Plant Genetic Resources Institute*
IPPC	*Integrated Pollution Prevention and Control*
ISPRA	*Istituto Superiore per la Protezione e la Ricerca Ambientale* (National Institute for Environmental Protection and Research)
IUCN	*International Union for Conservation of Nature*
MATTM	*Ministero dell'Ambiente e della Tutela del Territorio e del Mare* (Italian Ministry for the Environment, Land and Sea Protection)
MCPFE	*Ministerial Conferences on the Protection of Forests in Europe*
MiBBAACC	*Ministero per i Beni e le Attività Culturali* (Italian Ministry for Cultural Heritage and Activities)
MiPAAF	*Ministero per le Politiche Agricole Alimentari e Forestali* (Italian Ministry of Agriculture, Food and Forestry Policies)
MiSE	*Ministero per lo Sviluppo Economico* (Italian Ministry for Economic Development)
MIT	*Ministero per le Infrastrutture e i Trasporti* (Italian Ministry for Infrastructures and Transportation)
MIUR	*Ministero dell'Istruzione, Università e Ricerca* (Italian Ministry of Education, University and Research)
MSY	*Maximum sustainable yield*
NBN	*National Biodiversity Network*
NGO	*Non Governmental Organizations*
NSP	*National Strategic Plan*
PAF	*Piano d'Azione dell'Unione Europea per le Foreste* (EU Forest Action Plan)
PAL	*Programmi di Azione Locale di Lotta alla Siccità e Desertificazione* (Local Action Programs to Combat Drought and Desertification)
PEBLDS	*Pan-European Biological and Landscape Diversity Strategy*
PEFC	*Programme for Endorsement of Forest Certification schemes*

PFR	*Punti Focali Regionali del Sistema Informativo Nazionale Ambientale* (Regional Focal Points of the National Environmental Information System)
PGTL	*Piano Generale dei Trasporti e della Logistica* (The General Transport and Logistics Plan)
PN	*Parco Nazionale* (National Park)
PNR	*Programma Nazionale della Ricerca* (National Research Program)
PPM	*Plant propagating material*
PQSF	*Programma Quadro per il Settore Forestale* (The Framework Program for the Forestry Sector)
PRIN	*Programmi di ricerca di Rilevante Interesse Nazionale* (Research Programs of Relevant National Interest)
PSSA	*Particularly Sensitive Sea Areas*
PTNM	*Piattaforma Tecnologica Nazionale Marittima* (National Maritime Technology Platform)
RAMOGE	*Sub-Regional Agreement between Italy, France and Principality of Monaco*
RDP	*Rural Development Plans*
RIBES	*Rete Italiana Banche del germoplasma* (Italian Network of Germplasm Banks)
SAC	*Special Areas of Conservation*
SAP BIO	*Strategic Action Programme for the Conservation of Biological Diversity in the Mediterranean Region*
SCI	*Site of Community Interest*
SEA	*Strategic Environmental Assessment*
SFM	*Sustainable Forest Management*
SIT	*Sistemi Informativi Territoriali* (Territorial Information Systems)
SPA	*Special Protection Area*
SPAMI	*Specially Protected Areas of Mediterranean Importance*
SSC	*Species Survival Commission*
UAA	*Utilized Agricultural Area*
UIZA	*Unione Italiana Giardini Zoologici e Acquari* (Italian Union of Zoos and Aquaria)
UNCCD	*United Nations Convention to combat desertification*
UNCED	*United Nations Conference on Environment and Development*
UN/ECE	*United Nations Economic Commission for Europe*
UNEP	*United Nations Environment Programme*
UNEP/MAP	*United Nations Environment Programme / Mediterranean Action Plan*
UNWTO	*World Tourism Organization*
VPA	*Voluntary Partnership Agreements*
WAZA	*World Association of Zoos and Acquarium*
WFD	*Water Framework Directive*
WHO	*World Health Organization*