

## CHAPTER II: Drought – Desertification

### ■ Status

#### General

Water scarcity and drought in Greece should not be viewed only as a physical phenomenon or natural event, as it has also negative impact on the economy, environment and the society in general. The recent drought events in Greece, in particular in years 2006-2007, highlighted the vulnerability of the society to these natural hazards by reducing not only primary production of crops, grass and fodder, but also by jeopardising the constant supply of good quality water.

In terms of definitions, *meteorological drought* is commonly based on actual precipitation's difference from normal average over a certain period of time and is region-specific; *agricultural drought* occurs when there is not enough soil moisture to meet crop water requirements at a particular time and takes place after meteorological drought but before hydrological drought; *hydrological drought* refers to deficiencies in surface and ground water supplies which can be directly measured as stream or river flow and as lake, reservoir or groundwater levels, however due to the time lapse between rainfall and its appearance in streams, rivers, lakes, and reservoirs, hydrological measurements cannot be considered as the earliest indicators of drought; finally *socio-economic drought* occurs when physical water shortage starts to affect people, individually and collectively, when demand exceeds supply as a result of a weather-related shortfall.

Prolonged drought periods also result in soil exposure, erosion, land degradation and, finally, desertification. It is evident that in Greece the risk of land degradation and desertification is already taking place creating a vicious circle with climate change and human activity.

In Greece, the agricultural sector constitutes the highest consumer of water for crop irrigation for both national consumption and exports. The tourism sector is also characterised by a strong seasonal variation in water demand with peaks in the summer when resources are, by natural terms, at their lowest and with geographic peaks along the coast. Around 16 million of tourists visit Greece every year, while in 2005, only Athens attracted 6.1 million of tourists. Thus, water demand is often being shifted towards satisfying the needs of the tourism industry while also seasonally increasing considerably due to crop irrigation.

In Greece, water scarcity is not only defined from the "endemic" limited availability of water resources but in certain, point cases can also be aggravated by pollution incidents. The resulting problem is thus connected to both inadequacy of water sources as well as to possible limitation of required infrastructure and institutions for water management.

Until recently, remedial measures to combat water scarcity and droughts used to focus more on the development of new water resources to offset the increasing demand. However, the ever increasing abstraction of the limited resources has stimulated further a strategic approach focusing mainly on saving water rather than developing new water resources, in order not only to "manage physical resources" but also to "reform human activities to enable better benefit from the resources". Dialogue with users, participation of citizens and information and educational campaigns are essential elements, in this respect, of an effective water management system, permitting a demand regulation and a better use of amenities.

#### Water scarcity and drought profile of Greece

Mean annual precipitation in Greece approaches 850 mm/year, however it follows a highly uneven distribution pattern in time and space: Western Greece accepts the majority of rainfalls, more than 1,500 mm/ year, while Eastern Greece, along with the islands of Aegean and Crete, have considerably smaller rainfalls e.g. Attica's mean interannual precipitation is approximately 400 mm/year. On the other hand, evapotranspiration is quite high, especially in the dry eastern regions of the country. Values below 0.20 characterise dry regions, between 0.20 and 0.49 almost dry, between 0.50 and 0.74 almost humid, while values over 0.75 characterize humid regions. Most of Greece is either semi-arid or sub-humid according to the UNESCO's dryness scale (ratio of mean annual precipitation to the corresponding potential evapotranspiration), with only the regions west of the Pindos mountains being classified as humid while south-eastern Greece and the islands of Aegean including Crete are the driest areas of the country.

In general, the hydrologic regime in Greece, as far as the amount of total precipitation is concerned, corresponds to that of the other Mediterranean countries of the European Union (EU). However, eastern parts of Greece, as above mentioned, present a certain hydrologic particularity that considerably differentiates them in terms of their natural enrichment capacity; water shortage in these regions is further aggravated due to a higher degree of runoff which presents an uneven distribution proportional to the rainfall, i.e. areas of low rainfall are also characterised by more intense runoff.

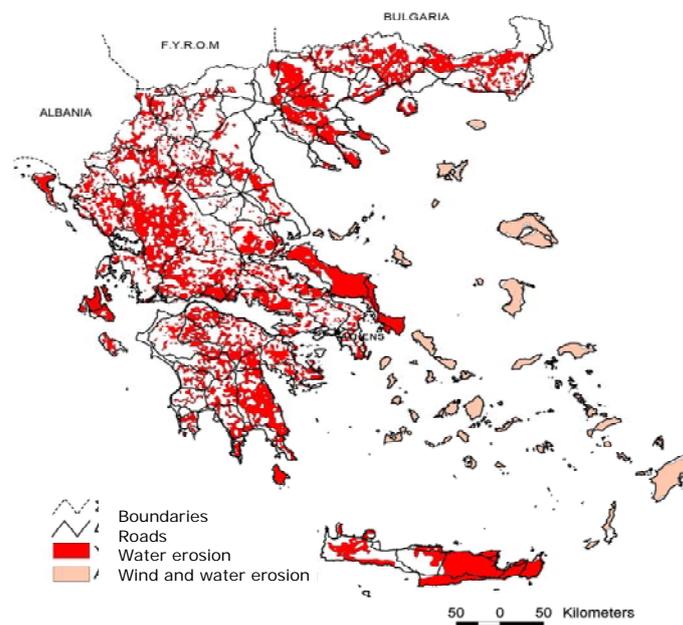
Above elements, provide evidence that water deficiency in the eastern parts of the country is a permanent "endemic" situation, presenting a seasonal fluctuation in its severity dependent on the weather conditions. This "endemic" situation combined with the very high water consumption needs and the water losses in these regions (particularly Thessaly for rural and Attica for urban use) establishes almost permanent conditions of water scarcity, namely permanent insufficiency and shortages of water that requires the systematic implementation of a long-term policy of integrated rational management both of the water resources and the water uses.

In particular, some 80-85% of total freshwater resources in Greece are surface waters. Moreover, one fourth of water is coming from upstream countries. The overall water demand of 7,907 million m<sup>3</sup> per year has remained fairly stable during the last decade, after having grown significantly in the 1990s. However, a marked shift has occurred towards a greater use of groundwater. Agriculture (mainly irrigation) is the dominant user of water, accounting for 86% of total withdrawals. Domestic drinking water accounts for 11%, industry for 2% and the energy sector for 1%.

In Greece, anti-erosion measures and works on mountainous water systems have started during the 3<sup>rd</sup> decade of the 20<sup>th</sup> century while the desalination and rehabilitation of soils and irrigation works have been intensified after the 2<sup>nd</sup> World War.

A mapping effort initiated by the National Committee to Combat Desertification (NCCD) indicates that 34% of the country is impacted to a high degree by desertification; 49% is moderately affected; while 17% is at low risk. The pressures are numerous: overgrazing of fragile land; non-integrated water management; non adequate protection of vegetative cover exacerbated by forest fires; and intense agricultural practices. Greece's climatic conditions, with long, dry summers and high evapotranspiration rates, favour desertification in the driest areas of the country that are also suffering from water scarcity and droughts, i.e. eastern areas and Aegean islands in general and in particular eastern areas of the Regions of Peloponnese, Sterea Hellas and Thessaly; central and southern areas of Macedonia; central and eastern Crete; and the Cyclades islands in the Aegean (see Figure 2.1 below). The resulting loss of productive, arable land from soil erosion and salination, and the over-pumping of aquifers to compensate for water losses, are among the key factors posing a desertification risk for the country which is, subsequently, further intensified by raising global warming effects.

Figure 2.1: Hot spots in Greece for water and wind erosion



Source: National Committee to Combat Desertification (NCCD), 2006

## ■ Decision-Making, Legal and Regulatory Framework, Policy Instruments

Greece ratified the United Nations' Framework Convention for Combating Desertification (UNCCD) in 1997 with Law 2468/1997.

The Greek NCCD was first established in 1996. The Ministry of Agriculture was appointed in 1996 by means of Ministerial Decision (MD) 96990/9361/1996 as the national focal point for desertification abatement. Subsequent MDs 291203/2005 and 305116/2005 appointed the Ministry of Rural Development and Food (MRDF) as the national focal point, which corresponds to the same Ministry under a different title and extended responsibilities.

Due to the cross-sectoral and multidisciplinary nature of desertification issues, the composition of the NCCD includes representatives from various competent Ministries, Universities, Research Institutes and Non-Governmental Organisations (NGOs). In particular, composition according to the above mentioned MDs is as follows:

- two representatives from MRDF,
- one representative from the Ministry for the Environment, Physical Planning and Public Works, (YPEHODE),
- one representative from the Ministry of National Economy,
- one representative from the Ministry of Development,
- one representative from the Ministry of Foreign Affairs,
- two representatives from research institutes,
- three academia representatives (university professors),
- one representative of NGOs active in the field of desertification,
- one university professor with expertise in soil science,
- one university professor with expertise in meteorology.

The fourteen members of the Committee are appointed by the Minister of Rural Development and Food upon recommendation by the involved Ministries, Authorities and Institutes.

NCCD's activities are funded directly from the MRDF's budget and its day-to-day secretariat management is carried out by the administrative services of the National Agricultural Research Foundation (NAGREF). NCCD meets monthly or once every two months to coordinate and review activities as well as to strategically plan and decide on future actions and measures to be taken.

The NCCD prepared a National Action Plan to Combat Desertification (NAPCD) that was adopted in 2001; the coordination and the monitoring of the NAPCD's implementation is undertaken by the NCCD itself. The NAPCD also provides for the establishment of several Local Committees for Combating Desertification in Greece, one in each administrative Region of the country; the full establishment of these Committees is expected to be finalised in the coming months. Once fully operational, these Regional Committees will result in a restructuring and further invigoration of the implementation of the UNCCD and its monitoring procedures in Greece.

Moreover, the NAPCD addresses the urgent need to reverse an already occurring and visible desertification trend in 35% of the country's land as well as to prevent desertification phenomena and effects in an additional 60% of the country's area. NAPCD also includes a critical analysis and assessment of the factors and processes that control desertification pressures in Greece as well as general and sector-specific measures (agriculture, forests, livestock, wild fauna and water resources) to mitigate them. NAPCD's measures are implemented by several competent Authorities and Services at central (e.g. competent Ministries) and regional levels (e.g. Regions, Prefectures, Local Authorities). In particular, Local Authorities may refer to the NCCD for scientific guidance and information for implementation of the NAPCD's foreseen measures financed directly from their own budgets.

In the context of UNCCD's implementation, since 2001, four National Reports have been elaborated and submitted to UNCCD, with the latest submitted in 2006.

## ■ Strategies, Plans, Programmes and Projects

### Activities incorporated into the NAPCD

As above mentioned, the NAPCD was officially published in January 2001 and widely distributed to all related stakeholders of the public sector, civil society, local authorities, academia, institutes etc. Following an extensive consultation phase for several months, NAPCD's final version incorporated all proposals for improvements and was finally adopted by the Government in July 2001 (OJG 99605/3719), by means of a Joint Ministerial Decision (JMD) issued by the 6 involved Ministers (YPEHODE, Agriculture, Economy, Development, Foreign Affairs, Interior). The total estimated funds required for the abatement of desertification were calculated approximately until 2006 to EURO 450 million.

NAPCD encompasses guiding principles and strategic objectives to reverse already occurring desertification and prevent new occurrence as well as specific detailed activities, measures and actions for various sectors. The NAPCD's scope, in order to ensure effectiveness of measures, is to incorporate them and efficiently integrate them into other relevant thematic Operational Programmes (OPs) and Strategies, like the OP for "Agricultural Development and Reform of the Country-side" (OPADRC, 2000-2006), the OP "Environment" (OEP, 2000-2006), the OP "Environment and Sustainable Development" (OPESD, 2007-2013), the "National Strategic Plan for Agricultural Development" (NSPAD, 2007-2013), the various Regional OPs as well as the "National Strategy for Sustainable Development" (NSSD) that was first elaborated in 2002 and currently under revision according to the 2006 EU Renewed Strategy for Sustainable Development. Due to this integrated and cross-sectoral approach that has been followed, the NAPCD urges all involved authorities, agencies and stakeholders to:

- fully apply all measures described in NAPCD,
- incorporate the policies and measures described in the NAPCD into regional and local development plans,
- implement the NAPCD through coordinated and integrated local projects securing the consent and active participation of all related stakeholders,
- develop local agencies that will undertake responsibility for coordination and implementation of NAPCD's policies and measures at local level,
- elaborate and implement projects, studies and strategies required additionally to those described in the NAPCD for combating desertification at local level,
- implement the NAPCD starting with six priority sectors, i.e. water resources management, agriculture, forests, pastures, wild life and biodiversity, socio-economic sector and operation of competent agencies.

The NAPCD includes several general measures for the restoration of "desertified" areas which are distinguished in two cases: reversible and non-reversible. In detail, indicative measures included in the NAPCD for the above six priority sectors encompass, inter alia, the following:

#### i. Water Resources

##### (a) Implementation of the EU Water Framework Directive (WFD) 2000/60

The EU WFD's overall aim is the effective and sustainable quantitative and qualitative management of water resources in EU Member States (MSs). Through its provisions for monitoring of surface and ground water status (Article 8) and the program of measures (Article 11), the WFD proposes an Integrated Water Resources Management (IWRM) approach also giving a framework for long-term changes in quantitative management in order to address long-term imbalances between supply and demand, recalling that "all practical steps are taken to prevent further deterioration in status" (Article 4a). Additionally, the WFD considers that prolonged droughts "cannot reasonably have been foreseen" (article 4.6). Prolonged droughts are therefore "grounds for exemptions from the requirement to prevent further deterioration or to achieve good status" thus measures that directly relate to drought mitigation are left as optional supplementary measures (WFD Annex VI, Part 5).

Although the WFD will contribute to the mitigation of the effects of droughts, this is not one of its principal objectives. In most cases, droughts are identified at a late stage and emergency measures are undertaken in a urgent and generally insufficient way. Clear and consistent criteria for an early detection and warning of drought situations, therefore, need to be established. Such criteria would allow sufficient time, before and at the beginning of a drought event, to look for suitable responses in the management of a water resource system.

Greece updated its water management framework by adopting a new water law (Law 3199/2003) in December 2003 that was complemented by Presidential Decree 51/2007 for the definition of measures and procedures for the integrated protection and management of water resources. This legislation is based on the EU WFD with its emphasis on ecological functions of water, river basin management approach, economic evaluation and full-cost pricing of water services.

(b) Establishment of Central Water Agency (CWA) and Regional Water Directorates (RWD)

YPEHODE has overall policy, regulatory, monitoring and control responsibilities of water resources above mentioned. Law 3199/2003 created and renewed a number of institutions with regard to water management. In this context, the CWA was established within YPEHODE, with responsibilities of definition and oversight of the national water policy reporting directly to the Minister. Moreover, a National Water Committee was formed as the political body consisting of six co-competent Ministers and responsible for setting water policy and overseeing implementation; the Committee meets once a year. Finally, a National Water Council was established to assist the National Water Committee; it consists of 24 members, including representatives from political parties and Municipal Water Supply and Sewerage utilities. At the regional level, the RWDs in each of Greece's 13 regions are responsible for the formulation and implementation of the basin plans. A Regional Water Council, consisting of approximately 30 members (stakeholders, NGOs), provides a consultative function in each region.

The CWA has recently developed strategies for drought and water scarcity management, based on a study conducted by the Agricultural University of Athens (October 2008), in which the steps for designing a clear and decisive action plan for proactive water scarcity management are elaborated.

(c) Preparation of IWRM plans for water districts

Management plans for river basins encompass compulsory measures and monitoring programs as well all required data, information and assessments for the protection and management of water resources aiming at addressing water supply and scarcity issues. Based on the EU WFD's provisions, the programs of measures can include additional means such as codes of good practice, water demand measures like effective management of irrigation water and conversion to less water intensive crops, water reuse measures especially in the industrial and agricultural sectors, construction works, desalination plants, site rehabilitation activities, artificial enrichment of aquifers etc.

In this regard, some of the measures that YPEHODE has proposed for implementation to RWDs, mainly for addressing winter water scarcity effects, are distinguished in short-, medium- and long-term ones. Short-term measures include, inter alia: information and awareness raising in order to control over-consumption; technical guidance to Prefectural Services for reducing pumps' operation; installing adequate metering devices intended controlling of over-consumption rather than a means for imposing bills collection; systematic control of irrigation and municipal water supply networks for mending possible leakages. Medium- and long-term measures include: design and construction of water conservation and water development works; surface and ground water quality control; surface and ground water quantity control through control of permitting and operation of boreholes; maintenance and replacement of irrigation and municipal water supply networks; systematic monitoring of water reservoir levels in comparison to water needs.

(d) Extension of the water storage facilities (reservoirs and artificial water recharging)

Construction of the following big water storage reservoirs have been launched by YPEHODE in 2005:

- The dam of Triantafyllia (Prefecture of Florina, Western Macedonia), with a height of 75m, a capacity of 10 million m<sup>3</sup>, for the irrigation of 40 million m<sup>2</sup>. It has a budget of EURO 45 million and its construction is expected to be completed in the next couple of years.
- The dam of Sykia on Acheloos River (Western Greece), with a height of 165m and a capacity of approximately 520 million m<sup>3</sup>. Part of its water reserve will be used for electricity production (80 MW) and part will be transported to the basin of the Pinios River (Thessaly, Central-Eastern Greece) for the protection of its ecosystem. Its budget reaches EURO 170 million.
- The dam of Aposelemis (Crete), for the water supply of the cities of Heraklion, Ayios Nicolaos and 8 more Municipalities in Crete, covering the needs of 270,000 inhabitants and 130,000 hotel beds. It has a budget of EURO 120 million and is expected to be ready in 2009.
- The dam of Piros-Parapiros (Peloponnesus), for the water supply of the city of Patra, covers the needs of about 300,000 permanent inhabitants, 11,000 seasonal inhabitants, 2 million passengers of the Patra port per year as well as the water supply needs of Patra Industrial Area (4.04 million m<sup>2</sup>).

To this direction, an important example is the case of the capital city of Greece, Athens. In Athens, a city with a dry climate, an explosive increase of water demand that emerged during the 20<sup>th</sup> century,

forced the Governments to build an extensive water resource system conveying water from surface reservoirs from long distances. A persistent drought that started in the late 1980s almost vanished every surface water resource available. At that time, a new project (Evinos project) was studied and its construction began. Simultaneously, severe water conservation measures were studied and implemented. These included two drastic increases in water price, with simultaneous discount for significant water conservation. The pricing measures were accompanied by a massive water saving information campaign. At a later stage, severe restrictive regulations were also introduced, which (a) prohibited and fined the use of treated water for irrigation, car and road wash and swimming pools, and (b) restricted the private consumption to an upper limit, which was 70-100% of the consumption of the previous year, and fined heavily the exceedance of this. The results of these measures were impressive as water consumption was reduced by a third. At the same time, individuals and municipalities searched for alternative local water sources, mostly groundwater from lower quality local aquifers to irrigate private and public gardens, to wash roads and cars and to use in industry. The entire experience shows the significant elasticity of water demand and its direct linkage to water pricing.

## ii. Agricultural Sector

Measures and actions listed below are indicatively selected from the OPADRC 2000-2006 as well as from the Agro-environmental Measures of the "Agricultural Development Plan Document" (ADPD) also under the 3<sup>rd</sup> Community Support Framework (CSF) for 2000-2006; funds spent for the implementation of the Agro-environmental Measures in general reached EURO 122 million for the same period. (See also from more details Country Profile's Chapter I: "Agriculture-Rural Development").

### (a) Organic farming and husbandry

This Measure aims to the reduction of pollution of agricultural origin, the protection of wild flora and fauna, the preservation of biodiversity of agricultural ecosystems and landscapes, the sustainable management of soils, the protection of public health and the creation of solid areas biologically cultivated in small scale economies. In terms of biological stock-breeding, it aims to the production of integrated products of high alimentary quality while protecting the environment, preserving biodiversity of agricultural ecosystems and landscape and sustainable managing of soils. Organic farming is one of the key priorities promoted under the various OPs during the 3<sup>rd</sup> CSF for 2000-2006, such as the ADPD but also the OPADRC and the OEP. Moreover, organic farming is continuing to be promoted under the OPs during the 4<sup>th</sup> Programming Period 2007-2013 (i.e. NSPAD and OPESD). Owing to this considerable financial support from both EU and national funds, organically cultivated crop areas have increased markedly in Greece, at a 60% annual average rate, reaching 4% in 2007 of permanent crop area (about 290,000 ha).

### (b) Long period set-aside of agricultural lands

This Measure aims in reducing surplus agricultural production and at the same time conserving soil and water resources.

### (c) Reduction of ground water nitrate pollution of agricultural origin

In the context of implementing EU Directive 91/676 on nitrate pollution in Greece, 7 vulnerable zones prone to nitrate pollution have been designated and enacted, coupled by 7 respective enacted Action Plans for their protection. Activities to reduce groundwater pollution of agriculture origin corresponds to Measure 3.5 of ADPD: initially, in 2000, activities would cover 35,100 ha, whereas today they are implemented by 10,900 farmers for an area of 114,000 ha, indicating that the initial aim was over-covered by 225%. During 2001-2004, 2,480 contracts were signed for participation to these activities corresponding to 24,800 ha, whereas during 2005-2006, 10,768 additional contracts were signed, corresponding to 112,800 ha, thus indicating an increase in contracts that exceeds 330% in two years. Activities similar to the ones included under ADPD's Measure 3.5 for the reduction of nitrate pollution will be continued under NSPAD 2007-2013.

### (d) Livestock's intensification reduction

This ADPD Measure aims at soil protection from erosion and conservation of biodiversity. It subsidises farmers to reduce their livestock capital in islands facing overgrazing problems as well as to increase the pasture land in areas facing erosion problems or of ecological interest.

### (e) Protection of wetlands

Significant wetlands in Greece, such lakes Volvi-Koroneia, several lagoons of the Region of Thrace, lake Doirani etc have managed to preserve their ecological functions and values throughout the

centuries due to the traditional and environmentally friendly agricultural practices that farmers followed. However, over recent decades, intensive patterns of cultivation resulted in a deterioration of their environmental status that required the enactment and implementation of several Measures under ADPD for restoration of the ecological status of these wetlands through, inter alia, promotion of environmentally friendly practices (fallowing, development of ecological compensation areas, crop-rotation etc) and reduction of the use of water for irrigation and fertilisers' run-offs. Measure 3.6 regards the protection of lake Pamvotis, with a total original budget for five years amounting to EURO 4 million and an area coverage of 1,300 ha. Measure 3.6 will be continued under NSPAD 2007-2013 covering an area of 3,000 ha. Measure 3.9 regards the protection of the lakes and lagoons in the Region of Thrace. During 2000-2006, 870 farmers participated in the Measure with an area coverage of 9,726 ha, while for 2007-2013, the expected area to be covered will reach 20,000 ha. Measure 3.10 regards the protection of lakes Volvi & Koroneia and during 2000-2006, 120 farmers representing an area of 1,400 ha participated in its implementation. During 2007-2013, this Measure will be incorporated into the above mentioned Action Plans for the protection of water resources vulnerable to nitrate pollution of agricultural origin. Measure 3.16 regards the protection of lakes and lagoons of the Region of Western Macedonia, with emphasis on lakes Vegoritida, Himaditida and Zazari. In 2006, a total of 29 beneficiaries representing an area of 229.5 ha participated in the Measure that will be continued under NSPAD 2007-2013 with an area coverage of 10,000 ha. Measure 3.17 regards the protection of lake Doirani, a transboundary lake shared with FYROM. In 2006, a total of 42 beneficiaries representing an area of 450.8 ha participated in the Measure that for the period 2007-2013 will be incorporated into the above mentioned Action Plans for the protection of water resources vulnerable to nitrate pollution of agricultural origin. All these Measures will cover new additional areas, apart from the ones currently designated, under NSPAD 2007-2013.

(f) Maintenance of traditional agricultural landscape

Measures 3.14 and 3.15 of ADPD regard the protection of the traditional olive grove in the area of Amfissa near the famous Delphi archaeological site (Central Greece) and the preservation of the traditional vineyards in the Aegean island of Santorini, respectively. Both agricultural lands offer ecological and high cultural/traditional functions as they are areas where both practices, i.e. olives and vines growing, are considered historically ancient and are conducted through traditional methods. Farmers participating in these Measures are subsidised to preserve traditional agricultural practices facing extinction, help protect the soil from erosion and land use change and development of ecologic compensation areas.

(g) Conservation and reconstruction of terraces on sloping lands for erosion protection

This Measure aims at soil protection from erosion, the increase of groundwater water storage and the natural replenishment of aquifers, especially in arid areas, as well as the preservation of agricultural landscape.

(h) Amendment of Codes for Good Agricultural Practices (CoGAPs)

With the CAP revision with Agenda 2000, the implementation of CoGAPs started aiming at a sustainable management of agricultural land, conservation of natural resources, protection of agricultural landscape and safeguarding of farmers' and consumers' health. Thus CoGAPs represented a decoupling of subsidies to farmers and stock breeders from the volume of production and/or the area cultivated or number of animals raised that were instead linked to the level of environmental protection of agricultural practices. Therefore, CoGAPs represented the minimum requirements for environmental protection based on which the potential loss of income of farmers abiding to these stricter environmentally friendly practices could amount to so as to calculate their consequent state financial support. CoGAPs have been revised and updated in Greece, through JMD 125347/2004 as amended by JMD 140920/2005, to satisfy current demands for environmental protection and to ensure compatibility to the CAP's most recent revision. CoGAPs implementation is obligatory for all farmers receiving direct subsidies according to EU Regulation 1259/1999 as well as to those that the measure of "equalising balancing compensation" applied (2<sup>nd</sup> axis of action under the ADPD) or those that implemented "agro-environmental measures" (3<sup>rd</sup> axis of action under the ADPD). CoGAPs apply to a very wide spectrum of the agricultural and husbandry activities as well as to various specialised cases, such as: soils with plant coverage with slope over 10%; strip rotation along contour lines with legumes alternating with other annual crops; areas that are plowed along contour lines in fields with slope over 10%; areas of alternating cultivated and fallow strips; sloping land where non soil eroding irrigation systems are applied; areas where grazing density reduction is implemented; soils with slope over 10% where the burning of crop residues is prohibited; areas where deep plowing to more than 40 cm depth is prohibited unless required.

iii. Forestry (See also from more details Country Profile's Chapter I: "Agriculture-Rural Development")

(a) National Forest Registry

The National Forest Registry is underway and is expected to be finalised by 2013. The Hellenic Constitution prohibits the conversion of forestland to other uses, however, forested areas, notably those close to Athens and in coastal areas, in some cases might be receiving pressure from building activities. Through the completion of the National Forest Registry (i.e. the identification of all forest areas), it is expected that public property will be safeguarded and forest fires by arson will be limited.

(b) Research related to desertification

Several research projects are being financed by the Greek Government and realised by NAGREF and the Universities of Thessaloniki and Thessaly (Forestry and Agricultural Departments). These research units have developed initiatives, inter alia, in the fields of public consultation procedures regarding the rational sustainable management of forest ecosystems and natural renewable resources, protection of natural environment etc.

(c) Forest management and protection

Regional Forest Services are in charge of managing forested areas, including ranger services, and of developing ad hoc management plans. These plans regulate tree cutting, grazing, hunting (on the basis of annual ministerial decisions), use of chemicals, collection of herbs and other plant species. Around 4% of forested land (about 160,000 ha) is managed for biodiversity protection, 20% of which for in situ conservation of genetic resources. Even though, to date, only one productive forest is eco-certified (by the Forest Stewardship Council), covering about 31,500 ha, national policy strongly promotes the implementation of a national forest certification system. Moreover, several programmes and actions to prevent degradation are being implemented in regions where wildfires (e.g. Mountain Partnitha in Attica Region, Eastern Peloponnesus Region, Chalkidiki in Central Macedonia Region) or other causes (drainage, overgrazing, etc) have adverse effects on the natural ecosystems.

iv. Biodiversity

The decrease of loss and of degradation of natural habitats is achieved through the establishment of protected sites. The progress in establishing Management Bodies for Protected Areas, as well as in the issuing legislative regulations have been significant so far in Greece, especially in recent years, with considerable positive effects with regard to desertification and drought mitigation in several areas. Moreover, these measures also contribute to the active involvement of all relevant stakeholders and to the decentralisation of competencies to the lowest appropriate level (i.e. Local Authorities, Prefectures, Management Bodies, etc).

Currently, YPEHODE is at the final stages of compiling, for the first time, the draft of a comprehensive integrated "National Strategy for Biodiversity" along the lines of the UN Convention of Biological Diversity (UNCBD). The Strategy's main objective is the halting of biodiversity loss in Greece with an implementation period of 15 years, 2009-2023. The Strategy, once finalised through a public consultation process and officially adopted by the Government, will encompass 23 policy targets categorised in 4 broad strategic objectives: protection of genetic resources, species and habitats; integration of biodiversity protection objectives into climate change adaptation policies, into physical planning, into urban planning and into tourism policies; cross-sectoral objectives like research, information, awareness raising, public participation, funding, governance strengthening etc; prevention of impacts from alien invasive species sprawling and Genetic Modified Organisms (GMOs). Implementation oversight and monitoring of the Strategy will be undertaken by a new special Inter-Ministerial Committee of 10 co-competent Ministries (YPEHODE, MRDF, Mercantile Marine and Aegean Islands, Foreign Affairs, Interior, National Economy and Finance, Education, Culture, Tourism). The elaboration of an Operational Biodiversity Action Plan and Roadmap for the implementation of the Strategy will follow suit.

This National Biodiversity Strategy which is underway will effectively complement and be integrated into other already existing strategic Plans and Frameworks apart from the NAPCD (2001), the OPADRC (2000-2006), the OEP (2000-2006), the NSPAD (2007-2013) and the OPESD (2007-2013), like the "Master Plan for the Natural Environment for the period 2000- 2006", the "Strategy for Wetland Resources" prepared in 1999 in accordance to the country's obligations as a party to the Ramsar Convention, the "2<sup>nd</sup> Revised National Action Plan for the Abatement of CO<sub>2</sub> and other Greenhouse Gas Emissions 2000-2010" (NAPCC, originally drawn up in 2002 and revised in 2007) and of course the

“National Strategic Reference Framework” (NSRF, 2007-2013) representing the overall strategic framework for Greece for the 4<sup>th</sup> Programming period of financial perspectives (2007-2013).

v. Socio economic sector

In this context, MRDF's main objective is the retention of population in rural areas, especially remote ones, through provision of technical support, health and social benefits, while encouraging investments targeting the development of additional or alternative economic activities, and thus income, for local populations either employed in the agricultural sector or not. These activities are encompassed in OPADRC's integrated agricultural development programmes.

Moreover, MRDF, within ADPD' 1<sup>st</sup> pillar, implements the “early retirement” scheme for farmers at an advanced age, since the ageing population in rural areas as well as the small-sized agricultural holdings are two of the most significant structural problems of the farming sector in Greece. Through this scheme, MRDF aims to progressively replace old aged farmers with younger ones, so that the average age of agricultural population be decreased. This is expected to contribute, in parallel, to the modernisation of the cultivation techniques and the creation of larger agricultural and economically viable exploitations, with emphasis being given to remote, disadvantaged areas.

Furthermore, MRDF continues to promote development of agrotourism activities in mountainous and other marginal lands by providing financial support for creating supporting infrastructure, mainly through the “LEADER+” Programme (2000-2006) which constitutes an EU initiative designed to improve the quality of life of the population of the rural areas and to attract young people into the rural economy, by implementing a set of actions which meet both national and EU priorities under the 3rd Programming Period, namely employment, equality, environmental protection, etc. In this respect, the Greek LEADER+ Operational Programme, had two general development objectives:

- Promote an integrated, high-quality, sustainable development of the rural areas, by means of pilot implementations;
- Support efforts to end the isolation of various regions, on all levels of economic and social life.

vi. Governance issues include promotion of efficient operation mechanisms of competent agencies aiming at the effective combating of desertification, including through reinforcement of research, exchange of information and training, organisation of monitoring mechanisms using appropriate indicators, etc.

### **Specific Framework for Spatial Planning of Coastal Zones and Islands**

Greece has the biggest length of coastline in Europe and its coastal zones are in cases subject to development pressures (e.g. pollution, exploitation of natural resources, urbanisation for tourism and holiday homes) as well as natural adverse phenomena (desertification, erosion, salination of soils, etc). An estimated 85% of the Greek population lives less than a 45-minute drive away from the seashore and one-third live in a 2 km-wide coastal strip. Also, an estimated 80% of industrial activities, 90% of tourism and recreation, most of fisheries and aquaculture, 35% of agricultural land (often of high productivity), and a significant part of infrastructure (e.g. harbours, airports, roads, the electricity network, telecommunications) are situated in the coastal zone.

The coastal and marine environment of Greece, with its beautiful landscapes and important ecosystems hosting numerous rare species, is one of the country's major economic and environmental assets. Greece has therefore been an active participant in the European Union's activities to implement Integrated Coastal Zone Management (ICZM) in accordance with EU Recommendation 2002/413, as well as in various projects through the Mediterranean Action Plan of the United Nations Environment Programme (UNEP/MAP). Also, during its latest Presidency of the EU in 2003, Greece convened an International High Level Conference on “Coastal Areas and Cities in Europe”. In the context of the above mentioned EU Recommendation 2002/413 on ICZM, Greece through YPEHODE has prepared and submitted, in 2006, to the Commission of the European Union (CEU) its national report including a wide range of specific actions focusing on strategic planning for preventive future problems, active stakeholder participation in decision making and policy implementation, and promotion of research, information generation, data collection and related monitoring systems.

Currently, YPEHODE promotes a National “Specific Framework for Spatial Planning of Coastal Zones and Islands” that, apart from guidelines, also provides operational specifications and is coupled with a practical action programme. The implementation of this Framework is expected to greatly improve

integration of environmental concerns in sectoral policies, in coastal areas, through a holistic approach. At the same time, an extensive and detailed mapping exercise of all property rights along the country's coasts is also at its final stages, aiming to further support integrated coastal zone management in Greece. Furthermore, a "Specific Spatial Framework Plan for Tourism" has also been elaborated and is expected to be approved during the first months of 2009. This Plan effectively complements the "Framework for Spatial Planning of Coastal Zones" in further promoting integrated management of areas near the coast by balancing all associated economic, social and environmental aspects. The main aim of this Plan is to offer guidelines, rules and criteria for the spatial articulation, organisation and development of tourism in Greece and for the respective infrastructure, as well as the setting out of a realistic action programme for the next 15 years (2008-2023). Both Frameworks effectively encompass national desertification abatement objectives as above mentioned as well as other complementing environmental objectives related to climate change mitigation and adaptation, biodiversity conservation etc.

## ■ Information, Capacity-Building, Education, Training and Awareness-Raising

Research related directly or indirectly to desertification has been conducted by the various Greek Institutes (e.g. NAGREF) and Universities (e.g. Agricultural University of Athens, Departments of Agriculture and Forestry of Aristotle University, etc) through funding mainly provided by MRDF and the CEU.

In particular, NAGREF (<http://www.nagref.gr>), acting as a technical support secretariat for MRDF, carries out research in various field related to desertification such as:

- Soil survey, evaluation and classification,
- Soil fertility and plant nutrition,
- Agricultural usage of sewage sludge and other liquid wastewaters,
- Soil pollution,
- Soil degradation,
- Soil erosion,
- Land reclamation,
- Efficient water use (i.e. mainly reuse of treated urban and industrial wastewater in agriculture to avoid fresh groundwater abstraction as well as water desalination),
- Analysis and ecosystems' sustainable management, including forest ecology, forest management and economy, pastures and management of natural biotopes,
- Forest policy and socio-economic research of forestry and rural economy,
- Preservation, restoration and rehabilitation of forests and natural environment including prevention and suppression of forest fires, forest protection,
- Development of environmentally friendly cultivation processes,
- Development of organic farming protocols,
- Sociological and demographical analysis of rural areas and rural population,
- Economic efficiency of alternative agricultural production technologies,
- Rehabilitation of excavation sites.

The Agricultural University of Athens (<http://www.aua.gr/>) and other Departments of Agriculture and Forestry of several other Greek Universities in collaboration with other Greek and European Institutes and Universities are conducting research, financed through national and/or EU funds, in topics related to the:

- Use of indicators for defining land sensitivity to desertification through EU research projects such as DESERTLINKS, PESERA, etc. A system of desertification indicators for European Mediterranean countries (DISMED, <http://dismed.eionet.eu.int/index.html>) has provided a tool to enable users from a wide range of backgrounds, including scientists, policy makers and farmers, to identify where desertification is a problem, assess how critical the problem is, and better understand the processes of desertification.
- Future of olive plantations on sloping and mountainous land and to the possible management scenarios for production and natural resources conservation (OLIVERO).
- Development of decision support systems for the integrated management of olive groves (DESIRE) and sustainable use of water resources (IMAGE).
- Development of surveillance system for assessing and monitoring desertification (DESURVEY, GEOLAND).
- Definition of soil erosion hot spots in Greece (by the Agricultural University of Athens) based on the available soil, vegetation, climate, topography and management characteristics using the Pan-European Soil Erosion Risk Assessment model PESERA.

Research activity is also carried by the National Observatory of Athens (NOA) (<http://www.noa.gr/>) through collaborative projects aiming to understand desertification in a systemic and dynamic way. As a first step, desertification and land degradation status are assessed, including diagnosis of driving forces and identification of areas currently vulnerable. The second step is the desertification forecasting using selected future climatic and socio-economic scenarios. The third step involves monitoring of desertification and land degradation status over large areas using objective and reproducible methods such as vegetation density remote sensing. These activities aim to bridge the gap between the knowledge generated on the processes underlying desertification and the practice of formulating policy to detect, prevent and resolve desertification risks.

YPEHODE's (<http://www.minenv.gr/>) activities focus greatly, especially through OEP 2000-2006, on promoting all dimensions of environmental information, such as monitoring systems, reporting and assessment mechanisms, data quality and access to information for the wider public. In parallel the country through YPEHODE, is fully participating to the operation of the European Environment Agency and the respective network EIONET by providing data and information to its data flow mechanisms, by applying the EIONET structure in the cooperation at national level and by preparing for the new concepts of the Shared Environmental Information System (SEIS) for Europe.

A wide range of data bases and information systems for environmental information broadly related to desertification have been developed by YPEHODE, including a National Data Bank for Hydrological and Meteorological Information, a National network for protected NATURA 2000 sites, a CORINE LAND COVER data base, a Clearing House Mechanism on Biodiversity, etc.

The horizontal connecting mechanism for the above databases, including also other thematic areas like legislation, environmental impact assessment studies and geographical information, is the National Environmental Information Network (NEIN), developed and operated by YPEHODE, as a wide network area including also an internet site for providing environmental information to the general public while currently adapting it to new web technologies and enriching it with a GIS aspect. NEIN also serve as a tool for implementation of the Aarhus Convention for public access to environmental information in Greece as well as relevant EU and national legislation while ensuring compliance of the environmental spatial information with the EU INSPIRE Directive.

Selected qualitative indicators, inter alia, on desertification, soil, land, climate change impacts etc were also presented and analysed by the National Centre for Environment and Sustainable Development's (NCESD) (<http://www.ekpaa.gr/>), supervised by YPEHODE, "Report on Sustainable Development Indicators of Greece" (2004); a similar more extended and comprehensive report is currently being finalised. NCESD is also conducting a wide range of information and awareness raising activities on desertification related issues by organising Roundtables, consultation events, publications and distribution of printed material etc.

## ■ Financing

Measures and related financial support for combating desertification in Greece have been incorporated in various other thematic OPs under both the 3<sup>rd</sup> CSF 2000-2006 (e.g. OPADRC, OEP) and the 4<sup>th</sup> Programming Period 2007-2013 of EU Financial Perspectives (e.g. NSPAD, OPESD), in the various Regional OPs as well as in the NSSD (see also under Chapter "Strategies, Plans, Programmes and Projects"). Therefore, distinctive activities and budgets allocated to specific measures only for desertification is difficult to discern from other related activities and measures.

Since 2003, a wide array of desertification-specific projects have been carried out to assess better the extent and impacts of desertification within the country, estimate the effectiveness of policies and measures already undertaken; and propose new remedial and preventative steps. In addition, substantial levels of funding is being allocated to other projects that contribute to the anti-desertification fight, but which are not designated as purely desertification-related activities in the budgets and respective OPs of implementing Ministries and Institutes. For example, EURO 650 million has been allocated by the Greek Government (MRDF) for re-establishment of lands impacted by forest fires over the 2007-10 period; EURO 236 million in 2006 to support early retirement of aged farmers (of which EURO 130 million corresponded to funding from the EU); EURO 19 million in 2006 for afforestation of agricultural land (plus EURO 10 million from the EU); and EURO 16 million of public expenditure for biological agriculture in 2006 (plus EURO 13.5 million from the EU. Regarding agri-

environmental measures in which organic farming is included, EURO 870 million have been allocated for the years 2007-2013, while EURO 122 million were spent between 2000 and 2006.

Moreover, the OEP 2000-2006 managed by YPEHODE has allocated, inter alia, EURO 190.13 million to activities related to water resources infrastructure, soil protection and protection from natural disasters, EURO 6.9 million for landscape protection and restoration as well as EURO 115.11 million for the re-creation of Karla lake. For the period 2007-2013, YPEHODE's OPESD has a total budget of EURO 2.77 billion (of which 80% from the EU Structural and Cohesion Funds) and focuses on several desertification related fields of action, like water resources protection and management (EURO 1.28 billion), soil protection (EURO 290 million), protection of natural resources and biodiversity (EURO 180 million), efficient tackling of environmental risks e.g. desertification, droughts, fires, floods and marine pollution (EURO 40 million).

NAGREF is also carrying out several research projects which are directly or indirectly related to desertification. In particular, its Institute for "Soil survey, evaluation and classification" based in the city of Larissa; its Institutes for "Soil science", for "Forest Research" and for "Land reclamation" in Thessaloniki, its Institute for "Soil science" in Athens as well as its "Mediterranean Forest Ecosystems Institute" have participated in 85 research activities, between 2002-2006, broadly related to desertification of a total amounting to EURO 3.51 million.

## ■ Cooperation

Greece is regularly contributing to all the replenishments of Global Environment Facility (GEF), the international independent financial mechanism which provides developing countries with grants for programs that aim at the improvement of environment globally and promote sustainability of local communities through activities related to biodiversity, climate change, international water resources, land degradation, ozone depletion and persistent organic pollutants. For its current fourth replenishment (2007-2010) is contributing EURO 5.73 million in four equal annual installments.

Greece's bilateral official development assistance (ODA) activities, in the fields of agriculture, rural development, desertification and drought management for the years 2002-2007 are as presented in the following table.

Table 2.1: ODA distribution in related thematic fields

in EURO	2002	2003	2004	2005	2006	2007
Agriculture	17,500	615,870	360,500	112,500	481,700	2,384,925
Rural Development	986,871	1,301,037	804,860	512,500	600,640	460,000
Desertification	1,474,991	3,703,340	928,300	140,929	458,600	7,326,645
Drought	2,357,163	1,899,463	1,505,401	1,201,362	1,273,571	1,975,562
Soil protection	138,518	235,318	—	453,000	266,652	202,000
Total	4,975,043	7,755,027	3,599,062	2,420,291	3,081,163	12,349,132

Source: Hellenic Aid, Hellenic Ministry of Foreign Affairs, 2008

More specifically, during the period 2002-2005 sixty programmes were implemented in Ethiopia, Albania, FYROM, Azerbaijan, Bulgaria, Jordan, Lebanon, Egypt, Mauritius, Jamaica, Kiribati, Syria and Turkey. These development assistance projects mainly focused on activities such as construction of water reservoirs, provision of water supply to rural communities, combating drought, water storage, forest management, food technology, management of natural resource and crop and animal production, management of transboundary waters, rivers' protection, environmental impact assessment, education on water management etc.

On the regional level, Greece together with Italy, Portugal, Spain, Monaco and Turkey constitute an the Annex IV Group of countries under the UNCCD, having agreed to co-ordinate their unilateral activities to combat desertification within the "Northern Mediterranean" geographic sub-region.

Moreover, Greece participates in the DISMED network project (Desertification Information System for the Mediterranean) coordinated by the European Environment Agency (see also under Chapter "Information, Capacity-Building, Education, Training and Awareness-Raising). This network aims to improve the capacity of national administrations of Mediterranean countries to plan measures and policies to combat desertification and the effects of drought. This aim is pursued by reinforcing communication amongst them, facilitating the exchange of information, and establishing a common information system to monitor the physical and socio-

economic conditions of areas at risk, assessing the extent, severity and the trend of land degradation.

Moreover, as regards ICZM, the Mediterranean experience, defined in the context of UNEP/MAP, the Barcelona Convention for the protection of the Mediterranean Sea and its Coastal Zones and its related Protocols, has been reflected in several MAP publications including guidelines for good practices. In 2003, the Contracting Parties of the Barcelona Convention agreed officially to establish a new Protocol for ICZM and erosion aspects in coastal zones. The new Protocol would target the implementation of Article 4, Paragraph 3 of the Barcelona Convention, which invites signatory parties to promote the integrated management of the coastline, taking account of the protection of areas of ecological and environmental interest and the rational use of natural resources.

This new Protocol on ICZM was approved by the 15th Meeting of the Contracting Parties to the Barcelona Convention in Almeria in January 2008. It was then adopted by the Conference of Plenipotentiaries in Madrid also in January 2008. The new Protocol provides, inter alia, for environmental impact analysis, protection and sustainable use of coastal areas, particular coastal ecosystems, coastal landscapes and islands, economic activities and cultural heritage, governance and climate change, with main objectives as follows:

- to facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development;
- to preserve coastal zones for the benefit of current and future generations;
- to ensure the sustainable use of natural resources, particularly with regard to water use;
- to ensure preservation of the integrity of coastal ecosystems, landscapes and geomorphology;
- to prevent and reduce the effects of natural hazards and in particular of climate change, which can be induced by natural or human activities;
- to achieve coherence between public and private initiatives and between all decisions by the public authorities, at the national, regional and local levels, which affect the use of the coastal zone.

Greece, being the host country of UNEP/MAP's Coordination Unit since 1981 and a Mediterranean country very actively involved in all Barcelona Convention's activities, has already signed the new Protocol on ICZM and is currently promoting its ratification.

Since the World Summit on Sustainable Development in Johannesburg in 2002 (WSSD), the Greek Government (YPEHODE and Hellenic Ministry of Foreign Affairs, with the support of a Secretariat undertaken by the "Global Water Partnership-Mediterranean") has undertaken the responsibility of leading the Mediterranean Component of the EU's Initiative "Water for Life" (MED EUWI).

The MED EUWI represents a strategic partnership among all related stakeholders in the Mediterranean region, aiming at contributing to the implementation of the water-related Millennium Development Goals (MDGs) and WSSD targets in the region, complementing at the same time all other relevant regional on-going processes and initiatives. In this regard, it aims to assist national efforts and strategies of the Mediterranean partner countries (N. Africa, East Mediterranean, SE Europe) to achieve their commitments under the MDGs and Johannesburg targets on water supply and sanitation and on IWRM by 2015.

The MED EUWI is an open ended partnership, open to all actors in the region sharing the same visions and goals and wishing to practically and actively contribute to the achievement of the water related MDG and WSSD targets in the Mediterranean, a unique but also vulnerable area both from an environmental and a political point of view. Cooperation between countries, within the MED EUWI, can thus significantly contribute to poverty eradication, enhancement of livelihoods and sustainable economic development, providing a catalyst for peace and security in the region.

Its main aim is to assist the design of better, demand-driven and output-oriented water programmes in the region, and to facilitate the effective coordination of water programmes and projects, targeting more effective use of existing funds, through identification of gaps.

In this respect, synergies and complementarity are systematically sought and ensured between MED EUWI and any other related new Initiatives that are launched in the Mediterranean; for example MED EUWI contributes to the "water pillar" of the new Initiative launched by the CEU in 2005 to "De-pollute the Mediterranean by 2020 – Horizon 2020" which represents, consequently, an instrument for the EU to identify priority actions in Mediterranean countries for funding during 2007-2013. Moreover,

coordination and cooperation is also ensured with the new GEF Strategic Partnership for the Mediterranean (2007-2012).

The means to achieve MED EUWI's targets mainly rely on the achievement of effective "donor coordination" on country level. In this regard, a strategic process entitled "Country Dialogues" was initiated in late 2005 with Lebanon, then in November 2006 the Country Dialogue of Egypt commenced which is also referenced as one of the key elements included in the Protocol on economic and technical cooperation between the Arab Republic of Egypt and the Hellenic Republic, signed at Ministerial level in June 2006. Several other Mediterranean countries had followed suit thereafter with similar on-going Country Dialogue processes. These processes constitutes a multi-stakeholder one, led by the countries themselves and aiming to assist formulation of national roadmaps for meeting the MDG and WSSD water targets as well as defining and prioritising the interventions required and the needed funding.

In terms of funding, YPEHODE supports the MED EUWI with a core annual budget reaching approximately EURO 100,000 to cover "horizontal" activities. In 2006, a co-funding by the CEU was activated to financially support selected MED EUWI activities, for 2 years (2006-2008), with the amount of approximately EURO 1.07 million. Moreover, the MED EUWI has managed to mobilize and coordinate considerable matching funding for the region. Key contributors in the process include, apart from the CEU, bilateral EU ODA, the World Bank, the GEF, Development Banks, UNEP etc.

In the context of the MED EUWI, increasing emphasis is being given to assisting the efforts of Mediterranean countries to increase their capacities to adapt to changing climate conditions in the Region. More specifically, Greece / YPEHODE, through the MED EUWI, has:

- Prepared a Position Paper on "Climate Change Adaptation and Integrated Water Resources Management in the Mediterranean" in December 2007 that has been widely distributed and discussed among Mediterranean partners aiming to provide a background of the current condition regarding impacts of climate change in the Mediterranean with emphasis on water resources, to assist Mediterranean countries with a systematic framework for developing national adaptation strategies linked with national IWRM plans as well as to promote a harmonised regional approach to address adaptation to climate change, under the MED EUWI umbrella.
- Organised, together with the CEU and MAP/UNEP, a Side-Event on "Addressing Climate Change Adaptation Challenges in the Mediterranean", during the 16<sup>th</sup> Session of the UN Commission for Sustainable Development (UNCSD), aiming at addressing issues pertaining to the special Mediterranean circumstances, which already a water-scarce region, is expected to face even more challenges with regard to its water resources in the near future due to the looming climate crisis (e.g. increasing frequency and severity of droughts, floods and other extreme weather events that lead to increased water supply-demand gap, desertification, infrastructure damage, loss of land due to landslides, saltwater intrusion due to sea-level rise, health issues, etc.), jeopardising the region's overall well-being.
- Organised, in the context of MED EUWI, an International Workshop on "Water and Climate Change in South-eastern Europe: Understanding Impacts & Planning for Adaptation" in June 2008, in Tirana, Albania, targeting SE European Countries.
- Submitted a project proposal in the context of the "Barcelona Process: Union for the Mediterranean" that was launched at the Paris Summit on 14 July 2008, that aims to support a "Multistakeholder Cooperation for the promotion of Sustainable Development in the Mediterranean with emphasis on water". This project proposal focuses, inter alia, on assisting, in practical terms, Mediterranean countries to build greater resilience of their water resources to climate change impacts.
- Prepared a detailed Technical Background paper on "Climate Change Adaptation and Integrated Water Resources Management in the Mediterranean" that was presented and adopted by Euro-Mediterranean Water Ministers at their Ministerial Conference on Water, in Jordan (Dead Sea), in 22 December 2008. This Ministerial Euro-Mediterranean Conference on Water also decided the elaboration of a "Mediterranean Strategy on Water" to be adopted by the next such Conference to take place during the first semester of 2010, that would focus mainly on drought mitigation and prevention through water savings and water demand management.