

CYPRUS REPORT FOR COMBATING DESERTIFICATION

CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	3
DESERTIFICATION FACTORS IN CYPRUS	
CLIMATE	5
SOIL	5
WATER MANAGEMENT	5
ANTHROPOGENIC FACTORS	6
GENERAL MEASURES TO PREVENT AND MITIGATE DESERTIFICATION	
CLIMATE	7
WATER MANAGEMENT	7
SOIL	8
REFORESTATION AND AFFORESTATION	8
FOREST FIRES	9
FOREST GRAZING	9
LAND USE PLANNING	9
INTERNATIONAL COOPERATION	11

EXECUTIVE SUMMARY

Desertification is one of the main problems that threaten the world's ecosystems and social structures. The Mediterranean region, in particular, has suffered from the fragility of its ecosystems, and, specifically, of its coastal areas, where most of the population is concentrated.

Cyprus has long realized the need for controlling and managing the phenomenon of desertification, with its short-term and longer-term impacts, on the natural environment and society as a whole.

Cyprus signed and followed the necessary procedures in order to ratify the Convention to Combat Desertification, which were finally concluded in December, 2000. The competent authority for implementing the Convention is the Ministry of Agriculture, Natural Resources and Environment. Cyprus has not yet prepared a National Action Plan according to the Convention, but after participating in COP5, has set up a National Committee to Combat Desertification with all the related departments giving initial information.

Despite the lack of a national programme and the gaps in legislation, as well as in the organizational structure to control and manage desertification in a holistic way, there is a serious effort by the different departments to establish an integrated approach to combat the problems encountered. There are already ongoing programmes aiming to control desertification.

The Cyprus government is making serious efforts in order to combat the impacts caused by desertification with existing programmes. The need for a comprehensive National Action Plan that will guide efforts towards a common goal – the fight against desertification, has been recognized. It is the government's goal to establish such a programme and integrate all efforts.

INTRODUCTION

Throughout its history, The Mediterranean region, Cyprus as well, has suffered from the fragility of its ecosystems especially of its coastal areas, where most of the population is concentrated. Desertification, in particular, has resulted in extreme losses in the productivity of soil resources and in the depletion and degradation of the quality of water resources.

The Cyprus government has recognized the complex dynamics of desertification that are affected both by natural phenomena as well as human activities. Thus, activities to combat desertification are pursued by a number of agencies that deal with specific aspects of the environment, such as water, and with human-related activities, such as town planning.

The need for controlling and managing the impacts of desertification on the natural environment and society as a whole is being given primary consideration.

A National Awareness seminar on desertification was held in Nicosia, in 1998 and a report was produced regarding the situation of desertification in Cyprus and the different measures taken or planned for combating the problems caused.

Following the Seminar, Cyprus signed and followed the necessary procedures in order to ratify the Convention to Combat Desertification, which were finally concluded in December of 1999. The Convention was ratified by the House of Representatives in 23.12.1999 by Law Number 23(III) 1999.

The competent authority for implementing the Convention is the Ministry of Agriculture, Natural Resources and Environment.

The Convention includes a special annex for the Mediterranean countries (Annex IV). Geographically, Cyprus belongs to this Annex.

Cyprus has not yet prepared a National Action Plan according to the Convention. After participating in COP5, the next step was to set up a National Committee to Combat Desertification. Already, the related departments have been given initial information and helped preparing this report. This Committee consists of representatives from the Departments of Meteorological Services, Forestry, Agriculture, Fisheries, Water Development, Town Planning and Housing, Geological Survey, the Institute for Agricultural Research, and the Environment Service.

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Cyprus is making serious efforts in order to combat the impacts caused by desertification. The need for a comprehensive National Action Plan that will guide efforts towards a common goal – the fight against desertification, has been recognized. It is the government's goal to establish such a programme in order to integrate all efforts.

DESERTIFICATION FACTORS IN CYPRUS

CLIMATE

Cyprus has a Mediterranean climate, with seasonal characteristics, such as rainy and mild winters, warm and dry summers and the short transitional seasons of spring and autumn.

Most areas of Cyprus are facing serious deficit in the precipitation - potential evapotranspiration balance. The situation becomes even worse under the drought conditions, which in the last decades occur more frequently than in the first half of the 20th Century.

The statistical processing of the climatic data for the 20th Century have shown an increasing trend of up to 0,01°C / year in temperature and a decreasing trend of about 1 mm / year in precipitation. This means that the climate of Cyprus is becoming warmer and drier.

The dryness of the climate, the trends in precipitation and temperature, rainfall and wind erosivity, are the factors contributing to the desertification process in Cyprus.

SOIL

Soil is a non-easily renewable resource, especially in areas with rapid degradation rates. From the agricultural point of view, the most important and severe factor causing desertification is erosion. More than 15% of the island's area is characterized by steep slopes and / or with high elevation.

WATER MANAGEMENT

The total annual precipitation of an area generally determines whether it is prone to desertification. Cyprus has an overall annual precipitation of about 480 mm. However, there are large parts of the Island that receive less than

200 mm of precipitation annually. These areas include the southern foothills of the Troodos Mountain Range and the Central and Eastern Mesaoria plains. These areas are prone to desertification.

Groundwater also plays an important role towards desertification. Overexploitation of this important resource usually results in sea intrusion and destruction of the aquifers thus adding to the desertification problem.

The use of low quality waters for irrigation is a factor that contributes to desertification. The long-term use of these waters causes degradation of the colloidal phase of the soils, high build-up of salinity, high concentration of toxic elements with an inevitable effect on commercial growing plants, etc.

ANTHROPOGENIC FACTORS

The human factors refer to those caused by the absence of people and those caused from undesirable, irrational or accidental human activities. Areas that have been abandoned from people are more vulnerable and more likely to face desertification. Absence of people means lack of human activities, which in turn means less protected or cultivated areas, exposed to winds, erosion and other natural forces. On the other hand, various human activities, such as the over-exploitation of water resources, uncontrolled fires, etc., can intensify the desertification process.

GENERAL MEASURES TO PREVENT AND MITIGATE DESERTIFICATION

CLIMATE

The climatic trends and the occurrence of drought are closely monitored. Reports and studies are prepared and relevant information is made available to the authorities and the public.

WATER MANAGEMENT

As previously stated, precipitation in Cyprus is unevenly distributed both temporally and spatially.

The increase in water use especially for irrigation and the inability to control pumping resulted in severe over pumping of the aquifers and sea intrusion into the coastal ones. In order to mitigate the problem large water works were constructed to store water in areas of plenty during the rainy season and use it in areas where the water resources are poor. Thus management of water demand is crucial as a measure to mitigate desertification.

Another important factor is the quality of water used for irrigation. Use of low quality water in irrigation should be minimized or avoided.

Water management is a key factor for conserving water. Emphasis is attached on the efficiency of irrigation systems and the scheduling of irrigation. In this way, substantial amounts of water are saved at farmer's level and used for other purposes.

Substantial work has been carried out in Cyprus, particularly in investigating and developing appropriate irrigation methods, identifying water requirements by main irrigated crop, scheduling of irrigation and effective water use (production per unit of irrigation water).

More than 95% of the irrigated crops are under modern irrigation systems, thus eliminating the possibilities of soil and water pollution. Moreover, the widely accepted by farmers method of fertigation (fertilization and irrigation simultaneously) has minimized fertilizers depletion, especially in mountainous areas and shallow soils.

SOIL

The agricultural land that has been affected by erosion and the amounts of soil lost through erosion are shown in the tables below:

Quantities of soil lost through erosion (tones/hectare)

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Soil lost	5,9	2,3	3,6	3,5	7,0	6,2	6,5	2,5	8,0	7,0	2,5

Agricultural land affected by erosion (square kilometers)

Period	1950-1980	1980-1985	1985-1990	1990-1995	1995-2000
Total area affected	2.430	1.305	1.230	1.215	1.125
Arable and permanent crop land	2.400	1.285	1.210	1.200	1.110
Permanent meadows and pasture	30	20	20	15	15

For the mountainous and semi-mountainous regions, a number of land improvements and constructions are subsidized by the government, such as bench terraces, land leveling, dry stonewalls, water tanks, etc.

REFORESTATION AND AFORESTATION

This activity has started in the 1980's as an on-going project to afforest land under extreme conditions. A total area of 4.300 ha has been afforested by the end of 2001. The area afforested in 2001 was 671 ha. The project will continue and it is estimated that a total area of 10.000 ha will be afforested in

the coming 10 years, at a cost of \$15 million. Another project undertaken is the afforestation of 5.000 ha of abandoned and degraded agricultural land at a total cost of approximately \$4 million.

FOREST FIRES

Wild forest fires constitute a major cause of land degradation in Cyprus. One of the major aims is the protection of State Forests against fires. A substantial part of the Forest Department's budget is allocated for fire protection. Despite the adverse climatic conditions that were prevailing during the last years, the forest area burnt was considerably small, being 380 ha in the year 2001, and 334 ha in 2000.

A number of departments and local authorities are cooperating in an elaborate fire protection system covering all areas outside the state forests. The cost of implementing this system is estimated at \$4 million.

In 2001, the European Union approved 0,5 million Euro to support a project for fire protection in the Akamas forest, to be implemented by the year 2003.

FOREST GRAZING

Forest grazing constitutes a major cause of land degradation in Cyprus. The problem is particularly present in the Akamas, Machairas and Randi forests. Measures have been taken to eliminate or diminish grazing in the forests by enforcing the Forests Law. On the other hand, grazing constitutes a major cause of land degradation in areas outside the state forests.

LAND USE PLANNING

Appropriate land use planning can help a lot in combating desertification. In order to achieve this, the following measures are currently pursued:

(a) Introduction of the “strategic impact assessment” of plans and programmes, such as the existing statutory development plans, that is the “Local Plans” and the “Policy Statement” for the Countryside.

(b) Preparation of the “Island Plan” that will provide for the strategic land use planning of the island as a whole.

(c) Enactment of a new type of physical plan, the “regional plan”.

(d) Ensuring that all the above plans are focused towards sustainability in a sense that they do not ignore the various economic, demographic and environmental factors and they do not degrade biomass productivity and other land activities and processes.

INTERNATIONAL COOPERATION

Cyprus has always had a strong co-operation with FAO, UNDP, WB, IAEE and EU. Currently, 3 EU co-operative research programs are in progress on water and one is expected to commence with FAO during the 2002:

- **HORTIMED** – “Sustainable water use in the Mediterranean Horticulture”. The project is aiming at developing a context-sensitive strategy for managing irrigation and nutrient supply of protected crops with constraints on the quantity and quality of water supply. The economic and ecological factors affecting the strategic decisions will also be considered.
- **IRRISPLIT** – “Partial root drying: A sustainable irrigation system for efficient water use without reducing fruit yield”. The project is aiming at developing a cropping system where partial root drying technique may be used to control excessive vigor, save irrigation water and reduce fertilizer use without influencing fruit yield and quality.
- **INCO-DC** – “Sustainability and Optimization of treatments and use of wastewater in Agriculture”. Objectives of this project are to produce in a sustainable way, irrigated crops with wastewater treated by low cost technology adapted to the Mediterranean environment. The two designated fields of research are wastewater treatment to obtain an effluent that can be reused in agriculture and irrigation techniques that are compatible with sustainable agriculture practices.

Other relevant initiatives are the following :

- **Coastal area management programme.** – This CAMP, initiated with UNEP/MAP findings, will cover most of the coastal area of Cyprus, in which the majority of economic activities such as tourism, housing, agricultural, etc., are concentrated. The coastal management programme will give emphasis to measures for combating desertification.

- **“Habitat Agenda” programme** - One of the supporting pillars for a sustainable housing policy is to combine adequate housing land with employment opportunities. To this extent, the housing policy will be combined with the various countryside development programmes, in order to reach appropriate strategic decisions. A proper decentralization policy for instance could facilitate the reversion of desertification processes.
- **Landscape convention** - Cyprus has recently signed the European Landscape Convention and therefore significant or important landscape sites will have to be preserved and protected. These sites have to be compared with the areas suffering from desertification and in cases where the two coincide, special and combined measures will be adopted.