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Challenges to the management of water resources and to countering desertification in the  
Mediterranean region**

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# Algerian experience in preserving fragile ecosystems from desertification

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## **Abstract:**

Unfavourable and severe climatic and physical conditions, combined to increased agricultural production, as part of sustainable production processes, are among the conditions for the reversal of the accelerated environmental degradation most of the south bank Mediterranean countries face today. This degradation is in many cases directly linked to rural poverty. Fragile ecosystems are invaded to extract a tenuous living and are destroyed in the process. Valuable resources and many biological species are lost for ever. Beside this, water scarcity, soil and ground water contamination, overgrazing still worsen this situation. The aim is to highlight the keys factors accounting for desertification and environment degradation in Algeria and to present measures that have proven successful in mitigating these phenomenon.

**Key words:** Desertification, soil degradation, grazing management, water resources management, environment preservation, sustainable development, arid and semi-arid zones.

## **Introduction:**

The implementation of sustainable agricultural production processes is rapidly becoming an imperative for many developing countries in the south Mediterranean basin. In this context, many effects can come together to start a desertification process such as: overpopulation, overgrazing, fires, recultivation with unadapted species, over-exploitation of water resources, soil salinization, wind and water erosion, loss and inadequate replacement of nutrients, combined to climatic variability and climate change.

The aforementioned effects are examples of environmental stress factors already affecting production and productivity in many regions of Algeria. Low productivity in many areas, especially the poorer ones, causes internal and external migrations and the encroachment and invasion of fragile ecosystems which are more often than not destroyed in the process.

Overgrazing is considered, beside classical agricultural activities in lands located in the Algerian arid steppic high plains, to be one of the main causes of desertification in arid rangelands. At times, livestock impact on the environment was very severe. For this reason, they were held responsible for destroying forest vegetation and leading to desert-like conditions in several parts of the Mediterranean and steppic area. As a result, authorities developed defence mechanisms to withstand grazing in very fragile zones and preserve hence thousand hectares of steppe.

In this context, the development of a sustainable agro-silvo-pastoral system, started many years ago, play today an important role in the management of natural resources and vulnerable areas.

It is clear that technology is not a magic solution to these problems. But an important prerequisite for any solution is the availability of skilled manpower, a serious financial backing and a sound training policy, combined to efficient research programs. Algerian representatives try to join together these important conditions. However, there is a need for further efforts to attenuate desertification phenomenon, enhance productivity and meet national needs.

How soon and how much of this will occur in this part of the world that has the most urgent needs for environmental protection? Clearly much depends on the ability of the countries to master techniques and processes to overcome sustainability problems, which in many cases threaten its population space of life. In this regards, Algerian policy makers adopted a set of measures, which in the long run, gave tangible results and a favourable impact on the environment.

### **1. Date palm tree cultivation in braving desertification phenomenon:**

The desert occupies almost 80% of the whole surface of Algeria. Date palm culture remains the pivot of the desert ecosystem. Its problematic is managed under different aspects: potentialities, technical and environmental constraints, socio-economic preoccupations.

The development perspectives projected to horizon 2010 aim to the rehabilitation, the enlargement and the promotion of date palm in order to preserve the oasis ecosystem, against desertification and erosion, by reducing the ill-fated effects of violent winds and intense sunstroke. This is an indispensable condition to maintain life and socio-economical activities and to stabilize millions of people.

Many palm groves were hence fully destroyed, ever buried under sand dunes, or under the influence of drought, and seriously damaged by Bayoud disease. The policy makers, aware of this situation, are encouraging their reconstitution in order to brave desert prominence. Beside, actions are planned at research level, in order to safeguard the oasis patrimony. The date palm culture renewal program is on way since many years.

Considering the limited amount of water available for irrigation, the lack of fertilization and treatment, soil erosion, salinity, climate severity, and other ambient stresses, it is even though, expected that date palm tree potential will increase significantly and its contribution in agriculture and environment sectors will rise tremendously.

### **2. Other major actions taken to secure development sustainability of arid and semi arid zones in Algeria:**

Algeria is increasingly aware of the need to control and manage the environmental dimension of socio-economic development. It is aware of the consequences which have already appeared-or could emerge- due to the development logic which creates individual and common wealth by rapid exploitation of non renewable natural resources and degradation of ecosystems which often endanger human and their space of life.

The country representatives in different sectors adopted a set of nature-protection regulations and modernized the legal system for environmental protection – Law for the development of renewable energies within durable development framework– and introduced development oriented actions such as:

- Actions for water protection are of high priority, particularly for ground water,
- Supportive measures for better water economy,
- Waste water treatment programmes in every town,
- Urban solid waste management and control combined to natural fertilizers production programmes,
- Appropriate irrigation techniques in agriculture (drip),
- Date palm tree culture enlargement,
- Sand hill fixing : the pilot experience achieved in ELMOSRANE (DJELFA) has to be adopted and generalized,

- Forest green barrier, which is an immense reforestation program, launched during the seventies, to hinder desert prominence and steppe lands preservation, enable today many socio economic activities,
- Ecologically adapted tree species for forest reconstitution,
- Steppe lands management and preservation,
- Rational and well planned grazing management,
- Extensive pastoralism encouragement,
- Biodiversity conservation,
- Conservation of forests and other fragile ecosystems, in the north band,
- Appropriate research centres and universities in charge with the specific arid and semi arid research programme development,
- Well oriented multidisciplinary research programs, with a select place for renewable energy research projects.

### **3. Scientific and technological constraints:**

The last quarter of the twentieth century witnessed unprecedented advances in science and technology and applications. Hopes were rising that these advances would result in an ever-increasing role for these technologies in resolving many problems facing human societies: improving food production, providing better cures to illness and diseases, creating better tools to fight pollution and improving the environment, creating more job opportunities, etc, particularly in countries belonging to the Mediterranean Basin.

Unfortunately the reality is completely different, and the south Mediterranean countries, sharing together the same arid space, are not benefiting as much from these technologies. Worse than that, development of science and technology is considerably retarded by the lack of communication culture among institutions as well as individuals.

Because some Mediterranean developing countries cannot achieve the R&D investment levels, infrastructures, and human resources necessary to be players in the field desertification limitation and related aspects, they are forced to call for and sometimes rely on non concerted technology transfers and external helps and investments for resolving their specific problems.

In such case, there is concern among some observers that the most relevant advice and assistance may not always be provided. The need for scientific information dissemination and skills is both well understood and well provided for; many scientists have received training in world class laboratories outside their own regions, and there is a continual flow of specialists, scientists and technical visits to countries. However, help with what comes after the laboratory seems more often to be lacking, help with engineering, with management, and with organization.

### **4. Integrated approaches:**

The last few years of this century are likely to evidence the emergence of products and services, if intelligently oriented, will have a profound effect on improving agricultural productivity and environmental sustainability. In this regards, OSCE member states have to sustain or discuss the following actions:

- Keeping member states experts up to date with world-wide innovations in technologies application in the specific field of desertification, with emphasis on what is more relevant to their region and/or what may be better adopted to respond to local needs;

- OSCE Forum should propose/provide a comprehensive scheme of training, collaborative research programs, and advisory services to the states touched by desertification phenomenon;
- Member states experts have to interact thanks to a well established and efficient network which can provide an open forum for discussion about threats and the projected/concerted action program;
- Cost effective state-of-the-art research and information management tools must find their way in infrastructure support package;
- Human resources development and library support must be enhanced with multimedia training systems and electronic libraries if only a small part of the demand is to be satisfied.

### **Conclusion:**

The OSCE member states should help conduct joint frontline research in desertification and related aspects and support the forum in which policy issues pertaining to the development and dissemination of experiences and know how and solutions are discussed, in order to end at concrete measures susceptible to be translated into future co operations in environment improvement and desertification reducing fields.

The policy issues should consider the manifest priorities of countries, namely, water supply, desertification attenuation, grazing control in rangelands, environment preservation, soil fertility, agricultural productivity improvement,...

The rural people and related socioeconomic aspects, local know how which are a fundamental issue should always be taken into account when planning and implementing land resources management and conservation programmes.

If things are to change, OSCE member states must set their objectives and escape from parochial definitions of needs and priorities. Furthermore, the scarcity of financial resources demands today a drastic reorientation of scientific and technological assistances approach.

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