FOCUS: LAND AND WATER RESOURCES MANAGEMENT IN MEDITERRANEAN COUNTRIES
GESTION DES RESSOURCES EN EAU ET EN TERRE DANS LES PAYS MEDITERRANEENS

INTRODUCTION

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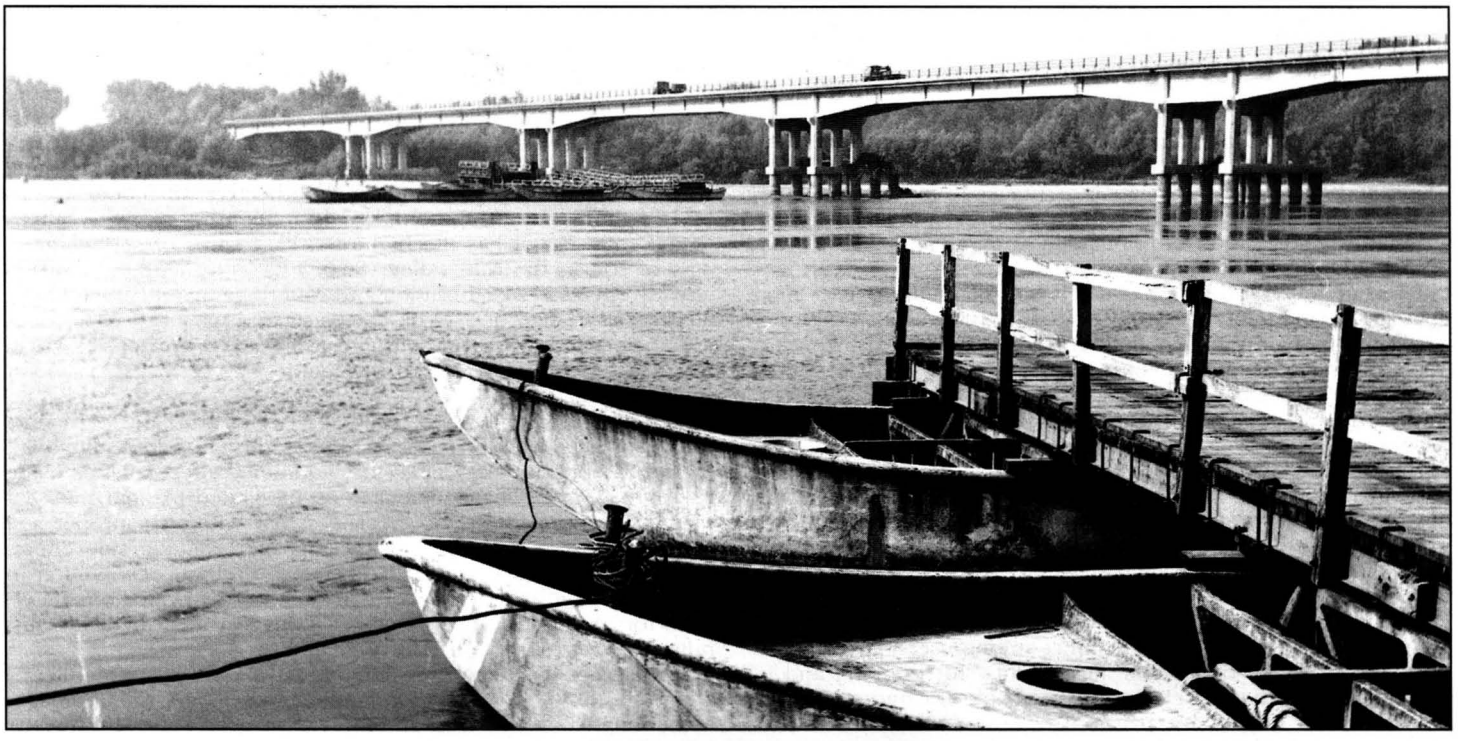

The notion of sustainability must be always contemplated in any of the human activities if the welfare of present and future populations is of any concern. Among such human activities, agricultural development is the most significant for the Mediterranean regions (and not only for them), where the challenge of a sustainable development is even harder than for other regions of the world.

Following one of the latest reports on the subject (FAO, 1992), *Sustainable development* can be defined as... *the management and conservation of the natural resource-base and the orientation of the technological change to ensure the attainment and continued satisfaction of human needs - food, water, shelter, clothing, and fuel - for present and future generations. Such sustainable development,....conserves genetic resources, land and water resources, is environmentally non degrading, is technically appropriate, is economically viable, and socially acceptable.* In this statement, the very important concept of "equity" can be also recognized. We cannot think of development without thinking of equity, social justice and environmental protection.

The paramount importance of sustainability has started to yield concrete actions at international level; the World Summit on Environment and Development in Brazil of June 1992 and the World Development Report 1992 of the World Bank provided evidence for both the relevance of the subject and the difficulty to deal with it at various scales (regional, national, global).

Bearing upon the previous statement, then, no doubts that Integrated Management of Land and Water Resources represents one of the very vital issues for a successful sustainable agricultural development in the Mediterranean Regions. The first aspect to be considered, in the harsh environment of the Mediterranean Regions, is the availability of water a factor which ultimately limits development of agriculture.

Water shortage is not a new phenomenon in the Mediterranean. What is new, however, is that it is occurring in a continuously changing environment, and this makes it more serious and long lasting. The water crisis is endemic or permanent in some Southern Mediterranean areas, but it has now reached also Northern Mediterranean countries such as France, Spain, Italy, and Greece obliging them to impose temporary restrictions. The shortfall in quantity has been additionally penalized by a decrease in quality due to the contamination of surface or ground water. In short, no country is safe from serious shortage in its water supply system, and management of water resources is one of the most urgent problems facing public authorities in the Mediterranean basin. Just to give you an idea about the magnitude of the problem, in the Middle East and North Africa, the water withdrawals correspond to more than 70% of the existing potential in water supply.

Furthermore, problems related to water resources are likely to increase in the foreseeable future due to their complexity and intricate links with many other human activities which cannot be solved through a single global strategy.

There is no doubt that water requirements in arid and semi-arid regions, particularly those of the Mediterranean, will continue to increase significanlty during the next several decades. However, the traditional response of increasing water availability to meet higher demands will be no longer adequate in the future for two important reasons:

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– many countries of the Mediterranean simply have no major additional sources of water to develop economically;
– even in those countries that may have additional sources of water, the time period required to implement their water supply projects are likely to be much longer than expected at present.

Nowadays, opportunities for implementing new irrigation projects are diminishing, investment costs are becoming increasingly high, and the new orientations of the world economy makes it a necessity for irrigated agriculture to be more cost-effective.

The software component of irrigation projects, i.e. management, is the word of wisdom for sustainable irrigation.

The problem of water shortages in the southern part of the Mediterranean is a development issue, since water limitations are seriously impeding the economic growth and development of these countries.

In addition to the natural climatic factors, water scarcity has been exacerbated by several other factors such as a rapid population growth, urbanization, industrialization, and increased irrigation needs to satisy the additional demand for food.

From the perspective of irrigation as practiced in the developing regions of the Mediterranean, inefficiencies and water wastage are a global phenomenon. As population continues to increase and available land is limited, there is concern to do "more with less" in terms of water and land resources. Since agriculture uses more than 80% of the region's water, some of the strategies required to tackle the problems are (i) more efficient irrigation, (ii) re-use of treated waste water whenever possible and (iii) adequate human resources development (HRD).

In the arid and semi-arid areas of the Mediterranean, the need is felt for major changes in the approach to water resources management if the challenges of the future are to be met. One of the fundamental changes required is a shift from preoccupation with development of water resources by major construction programmes toward a more balanced approach which emphasizes a more efficient use of available supplies, water conservation and demand management.

Undoubtedly, the next decade will be characterized by increasing scarcity, competition, and conflict among users. Growing demand for water by other uses, in particular for drinking and industry, reduces the share of water available for agriculture and investments in irrigation expansion.

The decrease in the availability of water for agricultural purposes, coupled with the requirement for higher agricultural productivity in irrigated areas, means that we have no option but to improve the efficiency by which water is used for agriculture in order to achieve more with less.

Efforts to encourage water conservation face special challenges which are not encountered with other natural resources. In much of the world, water is not controlled by market mechanisms because it is either free for the taking or unmetered. Nor is water a global resource that can be traded like petrolium or given in aid like food or medicine. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

The second aspect to be considered in the Mediterranean region is the problem of soil degradation which is immense and related both to environmental factors (fragile soils, rainfall distribution) and to human factors such as mis-management policies, economic factors, etc.

Two different kinds of pressure are exerted on the Mediterranean soils.

On the one hand, the land coverage of non-agricultural socio-economic activities is increasing leading to a net loss in surface area for agriculture. In this regard, the high urbanization rate, particularly in the southern part of the Mediterranean is imposing serious stress on the arable productive lands. In Egypt, more than 15% of farmland was lost for urbanization during the early five-year plan, and the crop area per capita is shrinking annually by more than 2%; in Libya, urban areas covered nearly 25% of excellent and good fertile agricultural land in 1980 and in Tunisia, between 1962 and 1974, land zoned for urbanization increased five fold in the coastal areas.

On the other hand, changes occur in the properties of arable land under the direct or indirect effect of agricultural activities (e.g. loss of arable land removed by erosion or the degradation of chemical and physical properties through the excessive intensification of agriculture and improper water management).

On the global scale, 46% of the earth's surface affected by soil degradation hazards can be directly due to poor water management. These hazards are roughly estimated as: erosion 22%, waterlogging and flood damage 8%, salinity and alkalinity 5%, frost 11%.

In the irrigated areas of the basin as a whole, waterlogging and secondary salinization of poorly drained soils are common occurrence. Secondary salinization deserves very special attention particularly in the southern countries of the basin with heavy evapotranspiration and in all cases where irrigated districts are poorly developed or inadequately. The share of irrigated land damaged by salinization amounts to 30% of the total irrigated area with an average estimate of ten million hectares abandoned yearly. In the Mediterranean countries 16 million hectares are salt-affected soils. Egypt has the highest risk in terms of surface area, 30% of soil in the Nile valley (80,000 ha of agricultural land) is already affected by salinization and waterlogging and an additional 40% shows sign of it; Syria comes second with 12% of its Mediterranean land, 5% is undergoing salinization in Tunisia, 3% in Algeria, and 1% in Morocco. In Greece 33% of irrigated land is similarly affected.

Although the previous two resources (water and land), taken as single subjects, already impose a tremendous effort in dealing with their related problems, a necessary additional effort must be made to approach their management in an integrated manner.

In fact, it is consensus of specialists that without a proper soil and water irrigation and drainage management, the side effects of salinization will continue to increase. Problem recognition in the last decade has shifted from on-site effects towards off-site effects for irrigation return flows or drainage waters high in salts, nutrients, pesticides and trace elements.

Water erosion is the most serious threat to soil in the Mediterranean. In the region 31% of land suffers losses from erosion amounting to over 15 t/ha and more than half of the lands in the watershed is prone to erosion. The consequences of erosion are much more serious for the countries South and East of the basin rather than for the Northern part. In some catchment areas with fragile rock in Italy, Morocco, Spain, etc., erosion rates may sporadically exceeds 250 t/ha per annum. In Turkey, where 70% of land is affected by erosion, it is estimated that 1000 m.t. of fertile land is lost from run-off and wind each year.

The loss of agricultural land would remain a permanent problem, which could worsen at any time in the most threatened countries (Syria, Lebanon and the Magreb, etc.), as a result of lack of adequate management according to the soil potentials.

The inability to check soil erosion and degradation process clearly seems to be one of the most serious threats.

Definitively, development of water and related land resources cannot be achieved effectively in isolation from each other.

For the Mediterranean region, integrating land use policies and practices with water management in river basin is important for formulating national strategies to sustainable agricultural development.

In conclusion, I do hope that your deliberations during this conference will be a valuable contribution to the updating and orientation of our training and research programmes to cope with the new challenges in the field of water and land resource management of the regions. We welcome your views on how we may work jointly more effectively and efficiently to research for development.

We are greatly honoured to have so many distinguished and authoritative scientists from fifty countries the world over participating in this event. Let me extend to you on behalf of the CIHEAM and Bari Institute a warm welcome and best wishes for a fruitful work and a pleasant stay in Bari. ●