DESERTIFICATION IN SOUTHERN EUROPE

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Abstract. The threat of desertification appears in southern Europe when periods of prolonged drought are followed by torrential rains falling on steep, unstable terrain. The plant cover of many regions has been degraded since very ancient times. Some are now recovering as a result of emigration and reduce pressure on the land. Tourist and commercial agricultural developments threaten habitat values and water supplies, especially in certain coastal areas. Relatively abundant archeological and literary resources offer excellent opportunities for tracing land use histories and throwing more light on the nature and direction of environmental change. Such longitudinal studies should be integrated with remote sensing and nested sampling on the ground of current landscape conditions and monitoring of current processes.

1. Introduction

Southern Europe is not usually regarded as being threatened by desertification. Only small areas are classed as semiarid but summer months are dry and there are years and runs of years when rainfall may be only two-thirds or a half of the long-term mean. Then, as in the early 1970s in Cyprus or the early 1980s in Spain and Sicily, reservoirs are almost empty, forest fires are frequent and the threat of desertification is apparent.

Much of southern Europe is tectonically active; slopes are steep and rocks underlying much of the mountainous terrain are susceptible to erosion. Soft sandstones, clays and marls of the Appenines weather deeply and are subject to landslipping on a large scale. Flakey shales and sandstones of the flysch yield thin soils and are easily gullied. Barren karstic uplands are extensively developed in Greece, Apulia, Malta, the Aegean Islands and especially in Yugoslavia where they occupy 35% of the country. There are old dunefields susceptible to wind erosion in eastern Croatia and in the Banat area east of Belgrade, but the main erosive agent in Yugoslavia as elsewhere in the region is running water.

Heavy rains of autumn falling on soils baked by the summer heat run off rapidly and carry a heavy load of soil with them. Amongst the soils most subject to erosion are the red and yellow earths probably formed in wetter periods of the past though some may include material of aeolian origin. When they are washed off hillsides they do not redevelop. The debris derived from them has accumulated in interior basins and along the coast where sedimentological studies reveal a history of successive periods of
weathering and denudation associated with climatic fluctuations, individual storms and erosion accelerated by man.

Palynologists, notably van der Hammen and Wilmstra (1978) working in Macedonia have revealed a long history of the changes in the vegetation cover with temperate forest widespread during interglacials and dry steppe during glacial periods. When the rest of Europe was covered by ice and tundra, as was the case on the last occasion until about 13,000 years ago, the lands of southernmost Europe afforded a relatively genial environment where temperate forest survived in humid areas. The flora remains rich in species, the number of endemic species being particularly high on the islands (Polunin 1980). They were the peaks of great mountains rising above the floor of the desert that occupied the Mediterranean basin in the latter part of the Miocene and which was then inundated by the Atlantic about 6 million years ago (Hsu et al., 1977).

The history of agriculture in the region goes back further than in most other parts of the world; for about 10,000 years men have been tilling the soil and his animals have been grazing and browsing on the hillsides. As a result the vegetation owes as much to human interference as to the subhumid climate. Now the remaining Mediterranean forests are complex and heterogeneous with a multiplicity of ecosystems that differ markedly in composition and nature. Most of the forest has been replaced by a stunted woodland of spiny, flammable evergreen shrubs and trees, the maquis of France, the macchia of Italy and the matorral of Spain. Centuries of burning, grazing and soil erosion have resulted in the widespread occurrence of more degraded communities called phrygana in Greece and garrigue in France, bushes less than a metre high with bare spaces between. Burning at short intervals followed by intensive grazing allows only the most resistant plants to survive, eventually leading in Greece, for example, to the formation of an asphodel desert (Margaris, 1983). The processes leading to the emergence of such barren landscapes can reasonably be described as desertification.

2. Sources of information about environmental change

Palaeoenvironmental studies are only beginning to unravel the chronology of the sequence of events culminating in desertification of this kind. It is always difficult to distinguish between the effects of droughts, climatic fluctuations and changes and human use or misuse of the land and this remains the case in the northern Mediterranean countries. However, the abundance of evidence available should allow a fuller story to be told than in most other parts of the world as new techniques of dating and interpreting remains from the past are employed and as specialists in different disciplines combine their knowledge and resources.

In "Man's role in Changing the Face of the Earth", Darby (1956) quotes various authors who provide some indications of the state of the plant cover in antiquity. Homer spoke of "wooded Samothrace" and of the "tall pines and oaks of Sicily." Thucydides wrote of forest fires and their effects. Plato portrayed the consequences of woodland destruction comparing Attica about 111 B.C. to "the skeleton of a sick man from which