

Conclusions

It is clear that the mobilization of dust in the Sahara and its subsequent transport through the atmosphere well beyond the Sahara is a natural process that has been going on for a long period of time. This has led to the formation of eolian sediments in the Mediterranean and the Atlantic and to the formation of loess soils in many adjacent regions and possibly as far away as the islands of the West Indies. Possible short-term effects of the dust deposition on terrestrial and aquatic ecosystems are less well understood.

During recent years, several cases of a substantial long-range transport (up to several thousand kilometres) have been documented by direct measurements. Rough estimates show that the Saharan area may contribute annually 60 to 200 million tons of soil dust to the troposphere. This is a substantial part – perhaps about 50%— of the total soil dust emissions into the troposphere and may have some influence on the regional and the global climate.

It is not at present possible to estimate what effect human activities such as agricultural practices, livestock grazing, wood cutting, etc., may have on the large scale mobilization and transport of dust in this region. Before such an assessment can be made, we must obtain much more knowledge of the processes that contribute to erosion and to the transport and deposition of the dust locally as well as at greater distances. The required research and measurement work is of an interdisciplinary nature and will have to include aspects of at least mineralogy, pedology, ecology and meteorology.

Among the main areas of research the following may be mentioned:

- Comprehensive studies to understand the production of fine particulate material by weathering and disintegration processes as a first and important step in dust production.
- A thorough documentation of arid soil composition in terms of mineralogy, particle size distribution and chemical composition, etc., for the whole Saharan area.
- A comprehensive study of Saharan meteorology on all scales to understand the rise and transport process of mineral dust within the Saharan area and out into the surrounding areas.
- Studies to understand the positive and negative ecological effects of dust deposition along the fringes of the desert areas, especially the relation to productivity of soils and coastal waters.

We make no proposal for specific institutional arrangements but note the desirability of having the investigations closely tied to institutions in the countries

surrounding the Sahara. An important task for UNEP and other international organizations is to strengthen such institutions by supporting research and measurement programmes.