



gimes initiated research on heat stress in humans, plants, and animals; on desert flora, agriculture, and horticulture, famine relief; and energy flux in buildings and building materials (e.g., Heffernan, 1996).

Also around the turn of the century, ideas emerged about the links between regional policy and landscape design. John Wesley Powell published a Report on the Lands of the Arid Region in 1878, which included innovative proposals for land and water management. H.W.S. Cleveland wrote Landscape Architecture as Applied to the Wants of the West, and although it referred to the midwestern U.S., it clearly asserted that different regions had different landscape design requirements (cf. Lewis, 1993).

These advances did not, however, prepare arid zone occupants for the disastrous drought, soil erosion, and economic depression of the 1930s. Those disasters gave rise to the U.S. Soil Conservation Service, to shelterbelt programmes, and to the expansion of irrigation. U.S. soil scientists such as Max Lowdermilk drew upon earlier experience in other parts of the world, such as Palestine and China. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia developed an interdisciplinary framework for arid zone research.

Comparative international arid zone research advanced more rapidly in the 1950s in large measure through programmes of United Nations

agencies, such as the arid zone research programme of UNESCO. UNESCO supported publications, scientific conferences, and research centres. Soviet research centres in Ashkhabad and Repetek were reported in an influential journal, Problems of Desert Development, which was paralleled by initiatives of the Chinese Academy of Sciences and arid zone research centres such as Jodhpur, India, that conducted research on sand dune stabilisation, soil erosion, and salinity.

Despite these growing international and national efforts, disasters continued in the 1960s and 1970s, most devastatingly in the semi-arid Sahelian region of Africa. While disaster relief programmes tried to cope with the consequences of desertification, other programmes of agricultural intensification and settlement aggravated them. Some modernisation programmes (e.g., roads and railroads) helped alleviate food crises while others increased drought vulnerability. The worst disasters, then as now, occurred in areas of political and civil conflict (Glantz, 1995). African food crises led to an expanded U.N. desertification control programme in the 1970's (EROS, 1995; UNEP, World Atlas of Desertification; and OSS-UNITAR spatial database).

Modest but increasing emphasis was placed on landscape design in arid environments, most notably at the University of Arizona's Office of Arid Land Studies and International Arid Lands Consortium (e.g., Miller, 1978). Efforts to combat desertification were paralleled by three other movements that shaped landscape design in arid regions: 1) the economic growth of OPEC countries which stimulated demand for landscape design and heritage conservation in the Middle East; 2) increasing historical research on arid landscapes; and 3) international and local environmental movements.

Increased oil revenues in the 1970s stimulated large-scale landscape construction in Kuwait, the United Arab Emirates, and Saudi Arabia. Landscape architecture also grew as a profession in these years in Iran, Iraq, Turkey, and India. Landscape designers in these countries