Summary

Desert-Margin Areas and the Development of Early Cultures
-
towards
the Neo-Deterministic Paradigm

The presentation focusses hydrological fluctuations in drylands, particularly in desert-margin areas, and their impact on cultural developement during the Holocene. The lecture is structured in four chapters.

First, as introduction, the presentation starts with a modern definition of desert-margin areas with respect to hygrological variabilities in space and time, in contrast to traditional two dimensional delineations as given by mean annual precipitation data or mean vegetation cover data.

In the second part two case studies concretise to typical desert-margin areas: along the Skeleton Desert / NW-Namiba, and east of the coastal desert / southern Peru. Both examples show how geo-archives, e.g. river-end deposits and desert-loess, contribute to reconstruct hydrological fluctuations defining desert-margin areas. This areas are socalled reactive regions because they react highly sensitive to hydrological changes triggered by, even weak, global climate changes. Especially abrupt or creeping aridisation had tremendous impact on early human societies and the development of culture by migration to geoecologically favourable sites like the river oases in western Peru.

Part three follows this perspective sketching out the development of the drylands in northern Africa and the Middle East since the Last Glacial Maximum (humidisation) and the Subboral (aridisation) in the 4th millennium BCE. The synthesis shows again how aridisation of dryland environments led to a concentration of people which triggered adaptation efforts, cultural differenciation depending on local conditions, the development of new techniques, script and labour division in first cities. It underlines the hypothesis that hydrological fluctuations in desert-margin areas contributed significantly to cultural development during the Holocene. With respect to climate change research, desert-margin areas and related geomorphodynamics can be excellent early warning systems due to global climate changes.

The final part is dedicated to the placement of the resulting discussion in the prevailing scientific paradigm. It considers the human being and human societies as one component of the System Earth. Man and environment should not be divided anymore. Both together belong to the same global system. This coincides with the Neo-Deterministic Paradigm.