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Jebel Hafit and the Al Ain oases (Eastern Abu Dhabi, United Arab Emirates): an integrative approach of a cultural landscape through the scope of geodiversity

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As it can be seen on satellite images, geological, and geomorphological maps, the Jebel Hafit and its foothills are a rare example of landforms developed at the transition between a compressive area in the east, i.e. the Northern Oman Mountains, and a stable cratonic platform in the west, i.e. the Arabic Platform which, from a structural point of view, represents the foreland of the previous folded domain. The mountains of Jebel Hafit formed in response to two main orogenic events in Late Cretaceous (obduction of Semail Ophiolite and associated rocks) and in the Late Eocene to Miocene (formation of foreland folds).

Concerning the environment, landforms of the Jebel Hafit appears today under extreme arid climatic conditions. But, as it is evidenced by the density and variety of archaeological remains that have led to the inscription of the sites on the World Heritage List, the situation was different yesterday. It is well known that desert have changed through time, so present conditions may not necessarily be those that have moulded desert surface. This is particularly clear when we travel back by the thought from present to a more or less distant period in the past. It is therefore legitimate to study the biophysical remnants of paleo-environments, which accompany the development of human settlements and the increasing impact of societies on the environment. A particular challenge will be to discriminate clearly the effect of the active present-day climatic-driven processes (such as thermal fatigue weathering, salt weathering, wind corrasion, sporadic flooding…) and those of prehistoric times, which requires a geoarchaeological and paleoenvironmental approach of the Holocene as a whole and also before (Late Pleistocene). An important point not to be forgotten is that severe rainstorms happen on the area only at a highly variable temporal scale, especially hurricanes coming from the Indian Ocean and that may travel west of the Oman Mountains.

At the level of human settlements and occupation, it is possible to characterize a threefold transition: first, the former transition between the pre-Islamic prehistoric societies and the development of Muslim societies; second, the more recent transition between the traditional historical society (farmers) and the contemporary society, characterized by the growth of urbanization, the creation of modern transport infrastructure and the concomitant growth of tourist flows; third, the current transition between the yesterday and tomorrow Al Ain City, due to the transformation of a local town centred on national economics all along the second half of the twentieth century, into an international town more open to the wider world with the management of a possible increased 20 % of tourist flow because of the inscription of Cultural Sites of Al Ain on the UNESCO's World Heritage List.

It is not possible to completely ignore the fact that the Jebel Hafit and its foothills are partly crossed by an international boundary. In case of political tensions, this may cause some difficulties for the management of this territory, with contradictory requirements between security, tourism, traditional land use, and scientific research.