

## ***Interactive comment on “Agricultural sustainability in the semi-arid Near East” by F. Hole***

**F. Hassan (Referee)**

fekrihassan@hotmail.com

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Agricultural Sustainability in the Semiarid Near East is an authoritative account by a leading archaeologist of the impact of climatic change and political events on the agricultural developments in the Levantine area of the Eastern Mediterranean over the last 11,000 years. This kind of transhistorical analysis linking the remote past with the present is very much needed if we are to understand the deeply seated structures that undergrid current practices and environmental conditions (cf. Hassan 1993) and to contribute to coping with current debates on sustainable development (cf. Hassan 2002).

As Hole aptly reveals, agricultural sustainability is in part a function of decadal and centennial variability in climate, and that it is influenced by short-term abrupt extreme

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climatic events. Although such fluctuations were influential in the emergence of agriculture in the Near East (Hassan 1981), a view that is now being widely accepted, the droughts associated with extreme cold events at 8.2 kyr and 4.2 kyr that are also evident in the Egyptian Sahara and the record of Nile floods (Hassan 2000, 2002) have also led to subsistence crises. In the Levant, the 8.2 kyr (8200 BP) event, as Hole notes, led to a general retraction of settlements. It also led to a dispersal of populations from the southern Levant to the Arabian Gulf, Arabia, the Egyptian Red Sea Coast and the Egyptian Sahara (Hassan 2000). This was a key event in the transmission of the domestication of sheep, goats, and the cultivation of cereals and pulses to a broad area outside the southern Levant. The 4.2 Kyr (4200 BP event) as reported by Hole led to the abandonment of sites in wetter areas of the Levant and the collapse of centralized government in Egypt. In more recent times, droughts coincided with the Arab conquest of many areas north of the Arabian Peninsula.

Hole is aware of the pitfalls of a simplistic climatic determinism and is clear on revealing the importance of social factors and the interplay between such factors and climatic events. I agree with Hole that we cannot ignore the impact of global climatic events on the course of agricultural and cultural developments in the region, and I am in total agreement with him that local environmental conditions in response to climatic variables and the prevailing patterns of social organization, settlement, technology, and ideology must be taken into consideration in assessing agricultural sustainability.

Hole's prognosis of the prospects of sustaining agricultural land use in the Levant is not hopeful. Indeed with increasing population and depletion of soil and water, it is doubtful that current agricultural practices can adequately meet the rising demand. The shift to "industrial" techniques to increase yield (through intensification or new crops) without proper consideration of their impact on the long-term integrity of the ecological system, especially water and soil, is likely to accelerate the demise of agrarian production. It is also essential to consider the financial cost of the transition to agro-industry and the impact of new practices on the social fabric of the local communities. The probable

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impact of ongoing global climatic changes and the political upheaval in the region are two other dimensions that are likely to determine the future of agriculture in the region. Tourism as a major source of income and urbanization (linked to employment in urban services) is also beginning to have an impact on the labor market, consumption styles, and acceptance of “rural” conditions.

## References

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