Water Resource Associates

A network of consultants in hydraulics, hydrology, groundwater & environmental issues

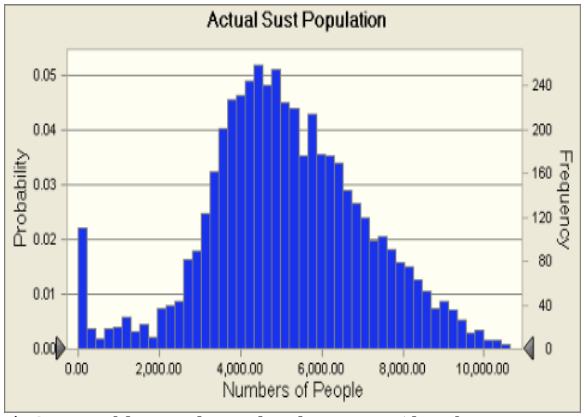
Project title: Water Life and Civilization: Impacts of Climate Change in Jordan.

Summary: Development & application of a hydrological and population model for Jawa in Northern Jordan.

Client: Leverhulme Trust	**Financed by:** Leverhulme Trust
Period of assignment: 2004-09	**Location**: Jordan
Project Value: £1.2 million	**WRA services**: £15,000
In co-operation with: University of Reading	**Background:**

Water supply ponds at Jawa , North-East Jordan

In an major study of water resources in Jordan, the Water Life and Civilization Project funded by the Leverhulme Trust (see www.waterlifecivilisation.org.uk) aimed to investigate the archaeology of ancient sites in Jordan as well as modern water resource issues. The focus is assessing the past, present and future impacts of climatic change making use of the Global Circulation Models developed at the Walker Institute at the University of Reading (see www.walker-institute.ac.uk) . In one component of the project, Paul Whitehead and Andrew Wade have developed a new model of hydrology and water use in the ancient city of Jawa (3500 BC). The hydrological model has been used to evaluate the impacts of climate change on the water supply to the city. Knowing the water needs of people, animals and agriculture, it has been possible to reconstruct the population levels in Jawa in 3500BC. The climate impacts on rainfall at Jawa have been estimated from the GCM run for the last 10,000 years. This has enabled us to assess the potential impacts of climate change on Jawa and we have shown that the populations of Jawa could not have survived the loss of rainfall in the area and Jawa was subsequently abandoned.



Sustainable population levels at Jawa (distributions obtained using Monte Carlo analysis applied to the hydrology water supply - water use model)

Scope of work by Water Resource Associates Ltd

Development of new hydrological model for hydrology and water supply with ability to estimate population levels. Assessment of impacts of Climate Change on population levels in Jawa in 3500BC.

Results

Paper accepted for Publication, entitled: Modelling of Hydrology and Population Levels at Bronze Age Jawa in Northern Jordan: a Monte Carlo Approach to cope with Uncertainty, Journal of Archaeological Science, September 2007.
PG Whitehead, SJ Smith, AJ Wade, SJ Mithen, BL Finlayson and B Sellwood.

Project Number 000127

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