

Wastewater reuse for irrigation in Jordan

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Figure 1: Soil sampling in the Zarqa River valley. Pictured, from the left, are Gemma Carr, Khalil Jamjoum, Sameeh Nuimat and the land owner.



Wastewater is a valuable resource in water scarce countries, such as Jordan, and treated wastewater from water treatment plants has been used directly and indirectly for irrigation for several decades. Recent developments in Jordan have seen the construction of a number of new wastewater treatments plants which produce wastewater of a high quality which is used for the irrigation of forage crops, fruit trees and landscaping.

Considerable discussion has taken place regarding the human health consequences

practices. At each site, soils were collected which had been irrigated with wastewater for different lengths of time. At the Kirbet As Samra wastewater treatment plant it was possible to collect soil which had been irrigated for 18 years while at the newer wastewater treatment plants such as Aqaba and Wadi Mousa the land had been irrigated for no more than three years. The types of crops being grown, water sources, irrigation methods, productivity rates and local climatic conditions were recorded through interviews with farmers and researchers working at the sampling sites.

The soils were then shipped back to the UK and laboratory analysis at the University of Reading commenced in June 2006. The analysis aims to reveal how the application of wastewater affects the soil salinity, the quantity of plant available nutrients in the soil, the amount of soil organic matter and the presence of potentially toxic elements such as lead, boron and cadmium.

The results of the laboratory analysis should enable conclusions to be drawn as to how the application of treated wastewater affects soils through time and under different environmental settings.

of using treated wastewater for irrigation around the world. This important issue continues to form a major component of research into the use of wastewater, but little work has been conducted to investigate the effects of applying wastewater on the long term sustainability of the soil, an essential and sensitive resource directly affecting agricultural production. An investigation into the effects of the long-term application of treated wastewater on the physical and chemical properties of soil is one of the topics being researched by the development studies group of the *Water, Life & Civilisation* project.

In May 2006, I undertook a research trip to Jordan, during which over 70 soil samples were collected. These came from six localities around the country ranging from the Northern Highlands to the Jordan Valley and down to the Red Sea. The climatic conditions at each locality vary, as do the soil types and the agricultural