



Water and sanitation in the Middle East

Dirk van Damme

A hot arid climate, high population growth rates and inadequate wastewater treatment all contribute to water shortage in the Middle East. This, taken together with the fact that the major rivers in the region flow across several international boundaries, points to one thing: the need for international co-operation between all countries in the region.

One of the few subjects on which the different political and religious factions in the Middle East would probably agree is that shortage of usable water is a major problem in the region. However, due to reasons including climatic changes, high population growth rates, political dissent, lack of technology and a lack of public awareness, the situation inevitably will become more drastic in the very near future.

Fresh water resources can be divided into two basic types: fossil water supplies and recently formed supplies either in the form of (treated or untreated) surface waters or recent groundwater reserves. Fossil water reserves in most Middle East countries are limited (see e.g. Rafid Alkhaddar's article, page 19). The countries of the Middle East will therefore have to depend on their surface and recent groundwater reserves.

If we look critically at the available water quantities and the present quality, the problems are mind-boggling. As to the available quantity, less rain is falling while population growth is very high in many countries. Thus rainwater harvesting by capturing rain falling on rooftops or gathering in seasonal streams (*wadis*) may look like an important option. The water thus intercepted cannot infiltrate the soil, however, and may result in a lowering of the water table below olive and citrus tree root-depth. Therefore, such methods can only be implemented safely after serious hydrological studies. An additional consideration is the quality of the water. After long periods of drought, hard surfaces such

as roofs and roads are covered with dust contaminated by car exhaust fumes containing high levels of PCBs, heavy metals, sulphuric compounds and so on. Rainwater from rooftop collection should therefore be used with caution.

Water quality is generally very poor in most of the region, due to inefficiently working or non-existent water treatment networks. This is a problem that needs to be resolved rapidly and also requires international co-ordination. For example, should the upstream country be the only one that has to invest heavily in water treatment or should the downstream country also contribute? And what level of water quality is acceptable to all the countries sharing the same river system?

These are not irrelevant questions since currently accepted water quality norms are being questioned in the West as well. Modern sewage treatment systems unfortunately do not purify sewage water completely: a lot of dangerous substances simply pass through the plant. Those that cause most alarm are the so-called HDCs or Hormone-Disrupting Compounds, which include a large number of industrial chemicals and pesticides that are oestrogen mimicking as well as the natural female hormones (in particular 17beta-oestradiol and oestrone). These last two are naturally excreted in the urine of women and subsequently reactivated in the sewage plants by bacteria. Ethinyl oestradiol from the contraceptive pill also gets into 'drinkable' water via the same route.

The effects of high concentrations of female hormones in treated water are very worrying. Among men they cause

testicular cancer (which has increased by 300 per cent over 50 years in Denmark), declining sperm counts, reproductive abnormalities and a decrease in the number of male babies born. In women, the effects have included an increase in the incidence of breast cancer by 50 per cent (Denmark) and puberty starting earlier and earlier.

The effects of HDCs have not yet been studied in populations in the Middle East, but a lot of oestrogenic chemicals barred in the West, including a number of pesticides (e.g. DDT and Lindane) and alkylphenolic detergents, are still widely used in the Middle East. While the need for educating the public at large in the Middle East on all matters concerning water is obvious, the issue is one that requires cultural sensitivity.

Another problem is that most rivers and aquifers are transboundary, which necessitates solid and durable agreements among the nations in the region concerning water supply partitioning at the international level and durable water management at the national level (see Saul Arlosoroff's article, page 4).

It is clear from the above that the water problem in the Middle East is complex. Desalination of seawater and of the salty fossil aquifers may be a partial help and probably will be necessary. But beyond these partial solutions the need is clear for strict and enforceable transboundary international co-operation between all countries involved. Nothing else is viable.

About the author

Dirk van Damme is a hydrobiologist working at the University of Gent, Belgium.