

Abu Dhabi's water conservation plans

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Abu Dhabi, which has the highest water consumption rate in the world, is planning to slash consumption and focus on conservation. Residents used an average of 550 litres of water a day compared with 85 litres in Jordan, a country with a similar climate, said Dr Mohammed Dawoud, manager of the water resources department at the Environment Agency – Abu Dhabi (EAD). The figure rises with the inclusion of water for agriculture and forestry, which was 68 per cent of total consumption in 2006.

High domestic water consumption in Abu Dhabi can be partly attributed to inefficient practices, such as watering gardens and washing cars, both of which use hundreds of litres of water at a time.

The US and Canada, with 485 and 425 litres per person per day, are the next highest consumers after the UAE, but unlike Abu Dhabi, have large water resources.

The EAD aims to reduce water usage by about 37 per cent to 350 litres per person per day. It is also working with scientists at the Dubai-based International Centre for Biosaline Agriculture (ICBA) to produce a master plan by the end of the year that will assess the emirate's water needs until 2025.

The master plan involved a shift in policy from increasing supply to meet rising demand, to focusing on managing demand, Dr Ismail said.

Scientists and policymakers have realised that Abu Dhabi's groundwater reserves are being depleted faster than they are being replenished and that desalination, the main source of drinking water, has a high environmental cost.

In 2006, Abu Dhabi pumped out 2.53 million cubic metres of groundwater a day, mostly for agriculture. Recent unplanned expansion of agriculture and forestry had used up the emirate's groundwater reserves faster than they were replenished, Dr Dawoud said.

One of the worst affected areas is Al Khazna, an agriculture area 40km from Al Ain, where the water table has dropped 80 metres in 25 years. Near the coast, depleted aquifers have been contaminated by sea water.

Most of Abu Dhabi's domestic water needs were met by desalination, and demand was 630m gallons per day in 2006, said Dr Dawoud. The process removes salts from seawater. Other Gulf countries have also invested in desalination facilities and the UN estimates that almost half the world's desalination capacity is in the Gulf.

Abu Dhabi has five large desalination plants that release brine with very high salt content of about 70,000 parts per million (ppm) back into the sea. According to classifications from the US Geological Survey, fresh water has less than 1,000 ppm and US oceans have 35,000 ppm. The brine released into the Gulf waters, therefore, has negative environmental implications.

Coral reefs and sea grass beds, which are a habitat for fish, sea turtles, dugongs and other marine creatures, are sensitive to any changes in salt levels.

Desalination consumes a lot of energy. According to the UN Food and Agriculture Organisation, a cubic metre of water produced by a desalination technology known as reverse osmosis requires a litre of fuel. This means desalination is responsible for the release of large amounts of gas, such as carbon dioxide, which contribute to climate change.

The Abu Dhabi master plan will bring big changes to agriculture, the heaviest water consumer in the emirate. In 2006, it was responsible for 56 per cent of water demand, while forestry accounted for 12 per cent. The EAD has set a target for 2012 for farms to cut water consumption to 18,000 cubic metres per hectare from 23,500 and for forestry to reduce to 2,500 cubic metres per hectare from 3,500.

Some savings may be achieved by advanced irrigation techniques. In addition, the master plan would ensure that no new forestry plantations were added, Dr Dawoud said.

The use of treated water for irrigating landscaped gardens will be encouraged to save desalinated water. All the emirate's treated sewage water, 150m cubic metres per year, is currently used for irrigation. However, Dr Dawoud noted that 40 per cent of water treated at the Mafraq Waste Water Treatment Plant, one of the largest in the world, was still released into sea. All treated sewage water would be used for irrigation within two years, he said. Treated sewage water could also be used for district cooling instead of the drinking water currently used in many districts. – The National