

China's water problems

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Qutang Gorge - Yangtze River in China

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China's geography and its population distribution are at the root of the problem. An estimated 44 per cent of this populous nation lives in the northern and northeastern provinces, and some 58 per cent of its cultivated land is also in this area; yet only 14 per cent of the country's total water resources are found in the region. Not surprisingly, this is the area with the serious water deficits.

Diminishing rivers

For too long, rivers - the main sources of water - have been abused. Diversion schemes for irrigating crops and dams for flood control, without careful planning, have in some cases reduced flows to a trickle, or worse. The Yellow River, at the heart of China's wheat- and maize-producing area, is a grim example - once one of China's main arteries, water flow now no longer reaches the sea on about 200 days of the year. Expected temperature rises in the region due to global warming add to frightening prospects for China's food production.

Where agriculture competes with industry and other urban needs, farmers, more often than not, lose out. Downriver of Beijing, on the Juma River, harvests have declined drastically as water levels have dropped - the result of increasing amounts being diverted to the city. Farmers have protested, but rural water users are used to the city's needs coming first.

Water wastage is another serious issue in China. All sectors have low water use efficiency, but particularly agriculture, where it is estimated that some 60-80 per cent of water is wasted through evaporation from canals and irrigation systems. As agriculture is the highest water user - worldwide figures are 69 per cent of freshwater used for agriculture, compared with 21 per cent for industry and 10 per cent for daily living - this represents a vast amount of water that could be saved. And

perhaps it could be saved, if irrigation methods could be modernised. Currently, one hectare of farmland under flood irrigation uses an estimated 20,000-30,000 cubic metres of water, while with new 'intelligent' irrigation technology this could be reduced by two-thirds to 7000-10,000 cubic metres. But the costs of buying and installing equipment over large areas are daunting.

As factories have multiplied along the river banks, a shortage of water treatment plants means that about 80% of industrial wastewater is untreated when it is discharged back into rivers. China has by far the highest total emission of organic water pollutants in the world - equivalent to those of the USA, Japan and India combined. Water quality ranges from poor to poisonous, but farmers have no alternative for watering their crops (and sometimes even for drinking).

Ironically, as well as water deficits, China's other significant water problem is flooding. Periodic deluges are part of the country's history, particularly in the south, causing significant loss of important agricultural land and harvests as well as a high toll in human lives.

Solutions?

But can these problems be resolved? An ambitious approach to tackling the shortages and floods, embraced by the Chinese authorities, is a massive water diversion scheme linking the water-abundant south to

the thirsty north. Canal building is already underway, and offers hope to the dwindling Yellow River, which will receive water from the Yangtze River. But costs are high - in terms of money but also ecological damage, loss of farmland, and displacement of people as the necessary dams, reservoirs, tunnels and aqueducts are put in place.

Water redirection projects are promising, but need to be part of wider water management policies that promote the development of more efficient use of water in industry, agriculture and for domestic use in cities. China also needs to tackle pollution, with modernised treatment systems for wastewater and improved urban water supply systems. That the water crisis is now affecting economic growth may be the spur that the government needs to begin decisive action to solve its water problems. Wisely, China is starting to encourage development in the south of the country where water is plentiful.

For further information on the Yellow River: see Water Management in the Yellow River Basin: Background, Current Critical Issues and Future Research Needs by Mark Giordano, Zhongping Shu, Ximing Cai, Shangqi Hong, Xuecheng Zhang and Yunpeng Xue, 2004 published by IWMI