

## **Blue revolution needed as world population swells**

**7 August 2006**

*Water experts, meeting in Brisbane next month during the city's annual Riverfestival will investigate the global challenge of meeting the need for water by a rising human population at a time of climate change. They will call for radical new approaches to tackle the threats to rivers and catchments, reports Don Alcock.*

As a thirsty, expanding world seeks out new sources of water, scientists, politicians and resource managers are under enormous pressure to find better ways to reduce poverty, feed additional millions each year, and restore damaged river ecosystems.

Major rivers, aquifers, wetlands and lakes are being drained to cope with expanding populations. Many large rivers now run dry before they reach the sea, as freshwater is diverted for agriculture and dams. Once-great rivers like the Yellow in China, the Ganges in India, the Nile in Egypt and the Colorado in the United States regularly dry up or clog up, with obvious consequences for human health, especially for people who depend intimately upon them for drinking water.

The world's population is expected to rise from the current 6.5 billion to 9.1 billion by 2050, mostly in the developing world, with freshwater shortages triggering increased environmental damage. More than half the world's five million lakes are now endangered.

According to the United Nations 2006 Global International Waters Assessment report, falls in river flows, rising saltiness of estuaries, loss of fish and aquatic plant species, and reductions in sediments to the coast are expected to rise in many areas of the globe by 2020. These in turn will intensify farmland losses, food insecurity and damage to fisheries along with rises in malnutrition and disease.

"Our immediate challenge is feeding an additional 70 million people each year and reversing ecosystem degradation," says Max Finlayson, president of Wetland International. Finlayson is an Australian wetland ecologist based at the International Water Management Institute in Sri Lanka. He and colleague David Molden, an agricultural engineer at IWMI, are keynote speakers at International Riversymposium in Brisbane.

"More people will require more water for agriculture, yet the way that people use water in agriculture is the biggest cause of ecosystem degradation. River systems and wetlands have born the brunt of agricultural driven degradation," says Finlayson.

Both scientists call for a new approach to solve water scarcity and poverty problems in developing countries. It includes securing access to water for poor small farmers for food security and targeting the use of water to generate income. They want to intensify agriculture but limit expansion in the use of water and land resources wherever possible; and increase the value per unit of water in agriculture by taking advantage of benefits from multiple uses of water.

"The way of doing business by treating agriculture and water management as almost separate processes from ecosystem conservation has not served us well. The past singular approach to biodiversity has had its day; in fact, given recent data it has probably failed us.

"We need a wider and more inclusive approach if we are to feed people globally and conserve the remaining biodiversity, let alone reverse past damage to wetlands and rivers," says Finlayson.

According to many river experts attending International Riversymposium, the world needs a Blue Revolution to conserve and manage freshwater supplies in the face of growing demand from

population growth, climate change, irrigated agriculture, industries, and cities—just as the Green Revolution transformed agriculture in the 1960s. A Blue Revolution will require coordinated responses to problems at local, national, and international levels.

Locally led initiatives show that water can be used much more efficiently. When communities manage freshwater resources efficiently, they also manage other natural resources better, improve sanitation, and reduce disease.

At the national level, especially in water-short regions with dense populations, adopting an watershed or river-basin management perspective is a needed alternative to uncoordinated water-management policies by separate jurisdictions. At the international level countries that share river basins can fashion workable policies to manage water resources more equitably. Development agencies need to focus more on assuring the supply and management of freshwater resources is better linked to social development and ecosystem health.

David Grey, senior water advisor at the World Bank, even goes further. He emphasises the relationship between the sophistication of a country's water management and its economic health. "Water is a key driver of sustainable growth and poverty alleviation as it underpins almost all types of economic activity, from farming to manufacturing, rural livelihoods, energy and transport."

Grey, another International Rivers *symposium* keynote speaker, believes the solution to water security in developing countries lies in establishing a good platform of water resource institutions and infrastructure. "If this is done, then countries reach a tipping-point where the overall impact of water enhances, rather than obstructs, a country's economic growth."

"Here is the challenge," says Grey. "Can the lessons of developed countries, enhanced by local and indigenous knowledge, provide alternative water management strategies, infrastructure designs and operations? Are there alternatives to infrastructure altogether – that still achieve water security, economic growth and poverty alleviation but have lower environmental and social impacts?"

Other keynote speakers include the Hon. Ian Campbell (Federal Minister for the Environment and Heritage), Dr John Olley (CSIRO Land and Water), Dr Caroline Sullivan, (UK Centre for Ecology and Hydrology), Professor Pedro Arrojo Agudo (New Water Culture Foundation), Roberto Epple (European Rivers Network) and Emilio Gabbrielli (Global Water Partnership).

The International Rivers *symposium* is an annual forum that brings together river and catchment experts to share knowledge about how good science, community action and management can conserve world river systems and water supplies.

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