
Policy Brief

Australian Water Research Facility ***May 2007***

Linking water to human health and poverty

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Water of adequate quality is fundamental for human health, food production, the ecological condition of rivers and wetlands and, ultimately, poverty reduction. However, water is a finite and often vulnerable resource currently undergoing escalating demand. Population pressure on water resources is exponentially increasing and, at present, in Asia alone, over 2 billion people do not have access to adequate sanitation, and around 700 million do not have access to safe drinking water (Gleick 2000). Globally, over ten thousand people, mainly children, die each day from water-related disease (Postel 1998). Conflict over water is increasing, both within and between countries. For example, in the Australian-Pacific region, competing demands for water creates trans-boundary tension, often threatening both security and stability.

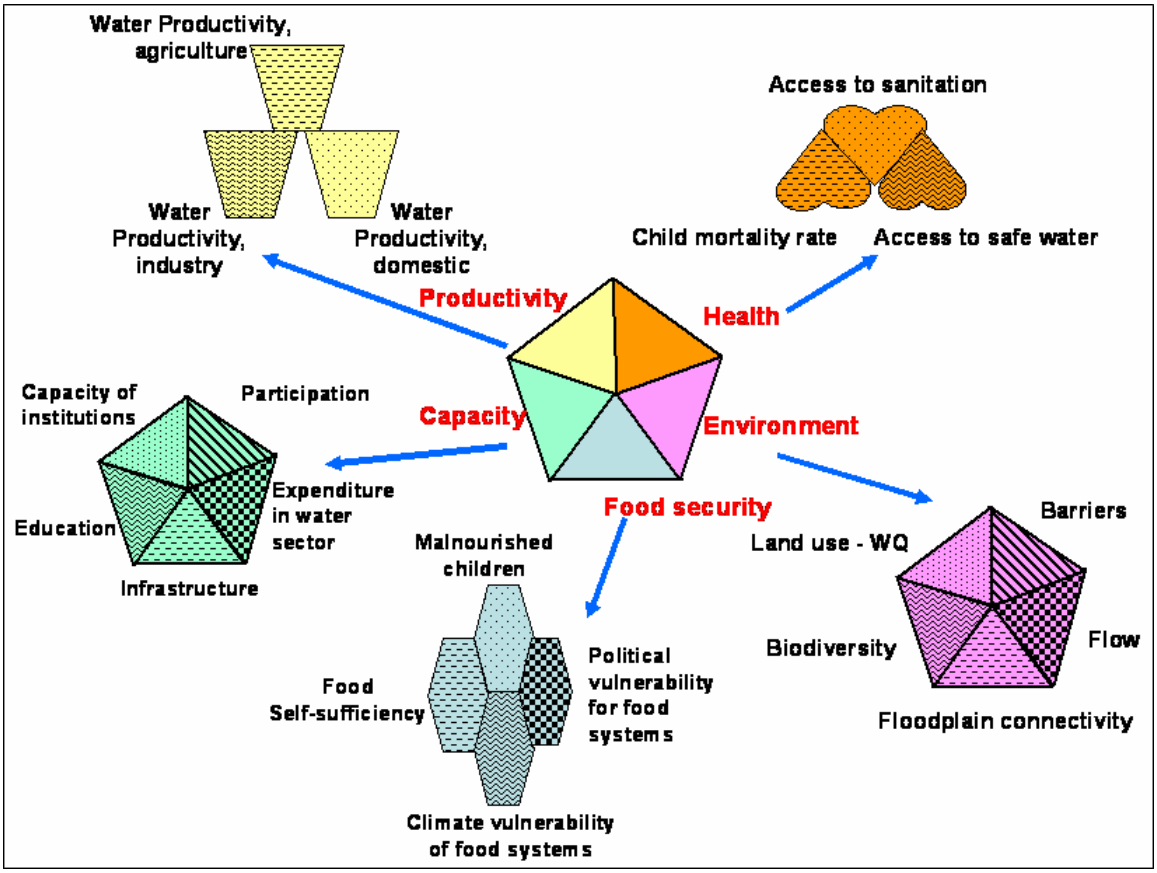
The UN Millennium Development Goals related to "ensuring environmental sustainability" aim to halve, by 2015, the proportion of people without access to safe drinking water. Despite the importance of water for economic, human health, poverty alleviation and environmental outcomes, funding of water projects is often *ad hoc* and consequently ill-targeted. It has remained difficult to determine which countries should receive foreign aid for specific water-issues. Australia, through AusAID, has much to contribute and suitable indicators will assist wise investment in the water sector.

Indicators linking water to poverty, human health, economic development and environmental degradation are being developed through the Australian Water Research Facility. This "Water Wealth Index" (after Sullivan 2002), will enable decision-makers to focus and prioritise development assistance both within and between countries and show which component of the whole-of-water-cycle represents the most "risk". The Water Wealth Index (WWI) is designed as a composite, integrative indicator using available data. Previously, few indicators included environmental issues. The newly-developed indicator includes measures of barriers to fish migration (dams and weirs), floodplain connectivity (the ability of flood flows to connect the river channel with the floodplain, which is important fish nursery habitat), water quality (derived from land use), flow (mean annual flows and other flow statistics) and biodiversity (from existing surveys of waterbirds, fish *etc*). The five major components of the index are (see table over-page for sub-components):

1. *Productivity*
2. *Institutional capacity*
3. *Food security*
4. *Environment*
5. *Human health*

The WWI is derived from the weighted-average of the five components. Each of the main components is made up of a number of sub-components of equal value although a weighting can be applied to increase the relative importance of an individual variable. Components are standardised from 0 to 100; giving a final WWI value between 0 and 100. The highest value, 100, is taken to be the best situation; the highest possible level of "water wealth", whilst 0 is the worst. Indicators are being evaluated in data-poor countries where incomplete information will require the use of surrogates. Data availability at a catchment scale for Pacific Island Countries, is also being assessed which would increase the spatial resolution of the analysis.

Parameter	Content
Health	
Access to sanitation	Access to adequate sanitation has a greater influence on health than safe water supply. Adequate sanitation refers to the availability of a latrine in or near the house, or flush toilet.
Access to safe domestic water	The percentage of people having access to safe drinking water.
Child mortality under 5	Child mortality under 5 is defined in general as the number of child deaths before reaching the age of five in relation to 1,000 live births.
Environment	
Water quality	Based on extent and type of land use in the catchment
Barriers	Barriers to fish migration and disruption to hydraulic connectivity. Measured as the number of dams/weirs from upland streams to the mouth.
Biodiversity	Based on existing surveys of fish, waterbirds etc.
Flow	Based on a number of flow statistics including variation and seasonality
Floodplain connectivity	The extent of floodplain alienation from river channels.
Food security	
Malnourished children	The proportion of children under five who are underweight for their age group.
Food self-sufficiency	Dependence on irrigation (food from irrigated agriculture).
Climate vulnerability	Climate vulnerability is measured as the rate of crop failure per crop area (in km^2) due to extreme events and impacts.
Political vulnerability	Includes a measure of income distribution.
Capacity	
Participation	Quantification of water rights and the amount of female participation in water management.
Expenditure in the water sector	Total expenditure on the water sector as a proportion of total fixed capital.
Education	Education index, (literacy, enrolment rates).
Infrastructure	Proxy by access to electricity
Institutional capacity	• Participation (mobile phones/water rights) • Gender: female labour force participation rate • Leakage rates, estimates of the value of water unaccounted for
Water productivity	
For domestic, industrial, agriculture use	• Domestic water use per capita • Industrial water use (jobs/km^3 by province) • Agricultural water use (jobs/km^3 by province)



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