



What's water worth?

Purely economic valuation of water often overlooks two important dimensions: environmental values, such as the role of water in maintaining ecosystems, and social values - such as growing food to eat

Of all the sectors that use freshwater, agriculture - which claims 70% of global withdrawals from natural sources - shows the lowest overall economic return. That fact has led some proponents of water valuation to champion unregulated "water markets" which, by treating it as an economic commodity, redirect water from low-value to high-value uses - typically from irrigated agriculture to higher value horticulture and from rural areas in general to the industrial and urban sectors. The reasoning is that, since demand outstrips supply when water is treated as a free good, the market will "bring supply and demand into balance" and, in some cases, mitigate the environmentally detrimental effects of overexploitation.

A "triple bottom line". But a new report from FAO says indiscriminate use of the economic approach risks overemphasizing "monetary expressions of value" at the expense of two other important dimensions: environmental values, such as the role of water flows in maintaining biodiversity and ecosystem integrity, and social values - which, at its most basic, can mean simply using water to grow food to eat. Needed, the study says, are water valuation frameworks that recognize a "triple bottom line" giving equal value to water's economic, social and environmental uses.

The report, *Stakeholder-oriented valuation to support water resources management processes*, argues that a sound valuation of water can only be done through a process involving all stakeholders. To explore stakeholder-oriented approaches, it presents cases from Cambodia, Sri Lanka and Tanzania where valuation tools and methods were imbedded in "real-world" water resources management. "We found that the concept of value is inherently subjective," says FAO's Leon Hermans, who co-authored the report. "In the end, value is really what the stakeholders can agree on. That's why we see valuation mainly as a practical means of helping stakeholders express the values that water



-related goods and services represent and supporting them in reconciling their water demands."

In Cambodia, for example, a survey in the tiny village of Veun Sean, in the Mekong wetlands, combined conventional economic valuation with participatory rural appraisal in order to understand the *in situ* value of water in providing ecosystem goods and services to local communities, particularly in terms of livelihoods, food security and health. A representative group of residents identified a variety of water values, including rice irrigation, transportation, waterfowl and even dolphins ("The group did not describe clearly why dolphins were important", researchers noted). All agreed that fish, a valuable source of nutrition and income, was the "most important" wetlands resource, especially for the poorest. For that reason, declining fish stocks were seen as a significant problem.

In Tanzania, another study analysed simmering conflicts among irrigated rice farmers, and between rice farmers and livestock owners, in the Mkoji sub-catchment in the country's southwest. Competition for water is rife in the area's middle and lower zones, where water flows regularly cease during the dry season. In the middle zone, paddy cultivation is

the main source of income, and conflict over water usually erupts early in the growing season during rice transplanting. In some years, competing farmers destroy water canals and intakes to divert water to their own fields, and some disputes have escalated into violence.

Livestock owners. Complicating water management in Mkoji are lower zone livestock owners who graze their herds locally in the wet season but must seek pastures elsewhere during the dry. Since adjacent wetlands were gazetted as a game reserve, many now move their cattle into irrigated rice areas, where they frequently damage irrigation intakes and canals. The result, the report found, is an impasse: paddy farmers fight each other for irrigation water, while livestock keepers must choose between entering into conflict with irrigators or game wardens.

To help unblock the situation, researchers set out to identify the values that underlie the conflicts. In the case of rice growers, they observed that disputes over water were driven by fluctuations in market prices - by marketing early, the average household could earn more than \$300 a year, compared to just \$100 later in the season. "The underlying value," the study found, "is the same for all parties: the conflict is not over water *per se*, but over securing a better income." The scarcity of rice on local markets was probably due to the scarcity of water to produce the rice. The result is a cycle in which water scarcity drives up the price of rice, which in turn reinforces demand for water as more farmers seek to take advantage of high rice prices, which in turn aggravates conflict over water. By clarifying these "underlying values", the search for solutions focused not only on water - e.g. improving water use efficiency - but on income generation. "A promising way out of the vicious cycle could be creation of a joint marketing system for rice," the researchers found. "For example, shared storage facilities would increase farmers' control over the timing of marketing and could increase their bargaining position. In this way, it could *create* value, by increasing the shared income from rice sales."

Meanwhile, the fact that lower zone livestock keeping is highly economic in terms of water use

suggested a strategy of "payment for environmental services" - a local mechanism allowing livestock keepers to gain access to dry season grazing land in Mkoji's middle zone in return for financial compensation or investments in alternative income-generating activities for rice farmers. Researchers noted: "Livestock keepers who illegally graze their herds in the game reserve are already paying for such access, but they are paying fines rather than taxes."

Finally, in southeast Sri Lanka, a third case study examined the scope for "trade-offs and complementarities" between inland fisheries and an extensive irrigated rice scheme in the Kirindi river basin. While the scheme had created new fishing grounds in its large head reservoir, drainage outflows had raised water levels and reduced salinity in coastal lagoons, which reduced the productivity and biodiversity of fisheries. To lower water levels, farmers also frequently drained the lagoons - and their fish and shrimp stocks - into the sea.

Production potential. After socio-economic surveys in a representative sample of villages, and workshops involving stakeholders and government departments, the study concluded that scheme had actually *increased* the production potential of fisheries in the catchment, from 1,500 tonnes a year to more than 2,600 tonnes. But actual production was negatively affected by scheme operation and water management practices, particularly in drought years. "Conflicts over water resources in the reservoirs and lagoons were the main issues of concern to stakeholders, rather than the overall impacts of construction of the scheme itself," the study concluded. "Stakeholder valuation helped establish a consensus that the fisheries in the project area should be restored and sustained, recognizing that at the very least this would require improvements in the efficiency of irrigation water management."

The FAO report uses the three cases to provide "a first outline" of a water valuation framework that reflects the importance of stakeholders as the key driving force in water resources management and adds to the existing base of valuation tools and methods.