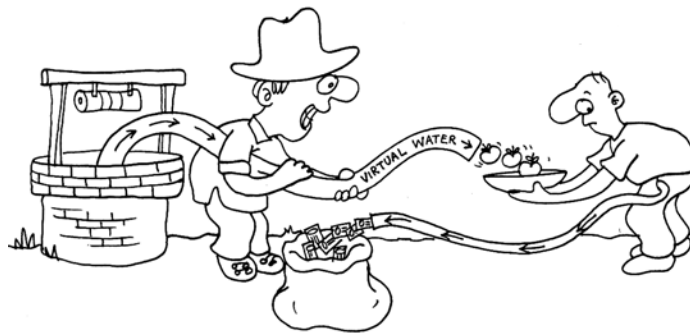


## It's called 'virtual water' ...

*Sowmya Kerbart Sivakumar*



The Third World Water Forum held in Kyoto, Japan, last year was marked by the popularity of a phrase that had emerged in the 1990s. It became central to discussions on global food trade during the decade and added a new dimension to the debate on world water management. Though academic in origin, its simple, practical and intuitive appeal brought on the realisation that, in a world heading for a deep water crisis, it may be time to talk of food and water beyond conventional relationships.

The earliest genesis of this catchy phrase, "Virtual Water", can be traced to Israeli economists. By the mid-1980s, they realised that it simply didn't make sense from an economic perspective to export scarce Israeli water. This was what, they argued, was happening every time water-intensive oranges or avocados were exported from their semi-arid country. The term "virtual water" was finally coined at a seminar at the School of Oriental

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**It's called 'virtual water' ...** , Sowmya Kerbart Sivakumar, *The Hindu*, June 06, 2004. <http://www.hindu.com/mag/2004/06/06/stories/2004060600150200.htm>  
[C.ELDOC1074515]

and African Studies (SOAS), University of London in about 1993. In fact, the idea had been described even earlier by Professor J.A. Allan as "embedded water" but, in his own words, "did not capture the attention of the water-managing community".

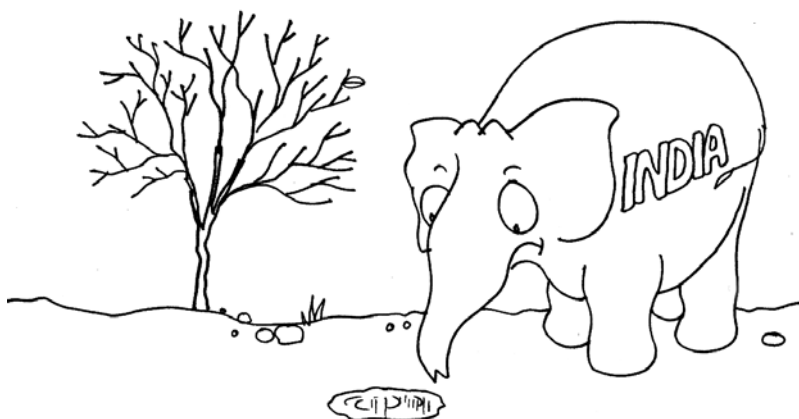
Put simply, we all know that water is required for the production of food such as cereals, vegetables, and meat and dairy products. The amount of water consumed in the production process of a product is called the "virtual water" contained in the product. This water is "virtual" because it is not contained anymore in the product. For example, to produce a kilogram of wheat we need about 1,000 litres of water. Meat, on an average, requires about five to 10 times as much.

Let us build on this a bit further and link food, water and trade. If a country exports a water-intensive product to another country, it amounts to exporting water in a virtual form. This "virtual water trade" is nothing but the virtual water content of the product times the trade volume of that product. What this means for the importing country is that it does not have to consume that amount of water in domestically producing the product.

If the importing country is already facing water scarcity, this represents real water savings and less pressure on its water resources. If the water-exporting country has abundant resources, the entire flow becomes an efficient instrument in improving global water use efficiency. *Thus virtual water trade has been touted as a "very successful means by which water- deficit economies can remedy their deficits".*

**In reality, things don't happen so neatly.** Take a look at the global virtual water flows today. The global volume of crop-related virtual water trade is estimated to be about 695 gm{+3} per year on an average

between 1995 and 1999. This accounts for about 13 per cent of the total world water use for agricultural production. Statistics show that India is predicted to be heading for some serious water shortages in the future. One of the top five exporters, its net virtual water exports were to the tune of 161.1 (10<sup>+9</sup>) cubic meters in this period! The problem with the so-called water-abundant countries is whether they will remain so in the future if they continuously "export" their water resources. For instance 1/15 of the water available in the United States is used today for producing crops for export — in Thailand, this rate reaches ¼ . Thus virtual water exports may seem feasible now, but not without adverse consequences for these countries in the future.



There are also some extremely important issues that come forward while talking of virtual water trade as a solution to water scarcity, mainly from the point of view of the importing countries.

### **Financing of Imports**

The International Food Policy Research Institute (IFPRI), in its report Global Water Outlook to 2025: Averting an Impending Crisis, points out

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that under a business-as-usual scenario, "developing countries will dramatically increase their reliance on food imports from 107 million tons in 1995 to 245 million tons in 2025. The increase in developing-country cereal imports by 138 million tons between 1995 and 2025 is the equivalent of saving 147 cubic kilometres of water at 2025 water productivity levels, or eight per cent of total water consumption and 12 per cent of irrigation water consumption in developing countries in 2025."

However, it also cautions that "The water (and land) savings from the projected large increases of food imports by the developing countries are particularly beneficial if they are the result of strong economic growth that generates the necessary foreign exchange to pay for the food imports ... . More serious food security problems arise when high food imports are the result of slow agricultural and economic development — that fails to keep pace with basic food demand driven by population and income growth. Under these conditions, countries may find it impossible to finance the required imports on a continuing basis, causing a further deterioration in the ability to bridge the gap between food consumption and the food required for basic livelihood." This is likely to be especially true of the countries of Sub-Saharan Africa, West Asia and North Africa.

### **Food Security and Food Self-sufficiency**

"A country must be food secure (self-sufficient) before any trade can begin. Can empty bellies attempt to trade, especially if the needs are sizeable and 'purchasing power' is lacking?" asks M. Gopalakrishnan,



Secretary General, International Commission on Irrigation and Drainage (ICID), New Delhi, in response to the Synthesis Paper on Virtual Water Trade, by Professor Paul van Hofwegen and team (2003).

His question perhaps sums up succinctly the concerns of countries like India, where an interplay of forces and compulsions will determine if virtual water trade is indeed a solution at all. According to him, "some countries which have to import food for one or other reason, if economically well off (high GNP) can import food/products (virtual water import). But countries (such as Sub-Saharan) having food deficiency and low GNP or those countries having food sufficiency (India and China and similarly placed developing countries) with low and low-middle GNP may not prefer to practice virtual water trade. Their socio-economic and other societal compulsions may not allow it." An added concern for populous countries (India, China, Indonesia etc.) is to maintain a minimum level of self-sufficiency "so that the impact of exigencies like drought and very large scale import requirements do not affect the global trade situation.



I BELIEVE WE WILL BE TOLD  
WHAT TO GROW IN OUR LANDS  
NEXT SEASON...

Echoing this view, Daniel Zimmer, Director, World Water Council, emphasised the difference between "food security" and "food sovereignty", at Kyoto. Many countries could resort to virtual water trade

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in order to achieve a sufficient food supply for their people, but many governments do not want or simply cannot afford to become dependent on global trade. **"This is crucial for countries like India and China ... they feel that because they have such large populations, the world market would not be able to supply their food demands in any crisis and so, as much as possible, they want to take care of their own food needs,"** he said.

### **Food subsidies**

A related issue is the size of export subsidies for agriculture in the European Union countries and the United States. The huge subsidies make the price of their products very cheap and affordable to importing countries and hence facilitate efficient virtual water trade. But as pointed out by international experts, "... on other hand, it creates a very destructive phenomenon: local products cannot compete with these imported products, which do not reflect the real cost of production ... . Local farmers cannot compete with such economic and productive forces; abandoning their own food production forces, some countries become more and more dependent on external food products ... *but what happens if the grain-producing countries cut subsidies to their farmers, potentially leading to significant price increases?*" This controversial issue has also been hotly debated in the recent World Trade Organisation Summit at Cancun, Mexico, and revolves around the underlying links between water, agriculture and politics.

### **Impact on livelihoods**

Virtual water trade as a policy option also has implications for local situations and people. As rightly pointed out in the Discussion Paper Virtual Water Trade — Conscious Choices by Paul van Hofwegen and Daniel Zimmer (August 2003), "... **it (virtual water trade) should contribute to local, national and regional food security requiring appropriate trade agreements which respect not only a nation's right to decide on their way to achieve food security but also local distribution mechanisms ensuring access to food.**"

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When a country opts consciously for virtual water imports to alleviate its water problem, it is also making a choice of altering its cropping patterns in a significant way. This could deprive farmers and their families of their livelihoods unless alternatives are developed in terms of other crops or alternative employment. In their absence, this choice could have a serious fallout, as unemployment is a problem most of the virtual water importing countries already face.

Another impact of going for water savings through virtual water trade could be an alteration (for the worse) in the organisation and ownership of means of production within the country. The case of Punjab exemplifies this. Dr. Sudhirender Sharma, Director of the Delhi-based Ecological Foundation, in an article for the portal [indiatogether.org](http://indiatogether.org), reveals that the Punjab Government is seeking the Centre's support for Rs.1,280 crores to wean away farmers from the traditional paddy-wheat cropping system. The objective: To save 14.7 billion cubic metres of water every year. The Government's game plan: To use this money to give farmers an incentive of Rs. 12,500 per hectare, relieve some one million hectares under paddy-wheat rotation and replace it with alternate crops like pulses and oilseeds. "This incentive will also move farmers towards a buyback arrangement with private companies", the article notes. The effects of such massive corporatisation of farming in crops, that too where minimum support prices have not even been declared (for pulses and coarse grains), needless to say, is bound to introduce a high level of insecurity among the farming community.

#### **Virtual Water and Diets**

It may be said in conclusion that, in spite of all its shortcomings, the concept of virtual water has certainly lent a new perspective to discussions on water management and the interlinkage between water, food and trade. It has also extended itself to newer concepts like "water footprint", which has an intuitive appeal even to the layperson.

The water footprint of a country is its real water use — its domestic use plus the net virtual water import — which is a useful indicator of the nation's demand on global water resources. Water footprints can also

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be calculated at an individual level; it is simply the sum of the virtual water content of all products consumed. Thus a meat diet implies a larger water footprint of about 4,000 litres of water a day, versus 1,500 litres for a vegetarian diet. Change in dietary habits of people can thus significantly change virtual trade balances. For example, if all the Chinese started eating like an average U.S. citizen, the virtual water trade balance of Central and South Asia, which is already a net importer of virtual water, would escalate severely! Thus being aware of our individual water footprint can help us use water more carefully. ▶