

Virtual water: impossible reality in Yemen

While Yemen suffers from grave water shortages, specialists and officials keep on warning that the country's water supply relies on limited groundwater. Only 125 cubic meters are available annually per capita, and the groundwater has been polluted and heavily overexploited for more than two decades, according to a German Technological Cooperation (GTZ) document.

In some regions, extraction exceeds replenishment by 400 percent. This endangers not only the drinking water supply for rural and urban areas, but also the livelihoods of small-scale agricultural farmers, the German aid agency GTZ warned. It is estimated that more than 90 percent of water resources are spent on irrigation. About 53 percent of the urban population has no access to centralized water supply systems, and about 75 percent is without centralized sanitation services.

Although the development sector has made significant progress in the past ten years, water sector organizations still need intensive capacity development to improve their effectiveness and performance. According to the GTZ, many towns and rural areas still lack a safe water supply and more than three million urban inhabitants need to have access to safe drinking water and basic sanitation if the UN's Millennium Development Goal related to this issue is to be reached in 2015.

Not only in Yemen has water become a scarce good. Most world countries share this problem since growing populations placed ever-increasing demands on the limited resources. However, some of these countries have tried to protect their water resources by using some recent techniques such as the "Virtual Water" concept.

Virtual water is the amount of water that is embedded in food or other products needed for its production. For example, producing one kilogram of wheat requires roughly 1000 liters of water, giving it a virtual water content of 1000 liters, according to figures released by the World Water Council (WWC). "Virtual water is the trading of water or trading of water in goods. We import stuff, the manufactured goods, and in fact we are importing the water used to create these products," said Dr. Mohamed Ibrahim al-Hamdi, Deputy Minister of Water and Environment.

The UN estimates that two to three liters of water are required for personal drinking purposes and 20 to 300 liters are for domestic needs. A person's daily diet, however, requires between 2,000 and 3,000 liters of water in agriculture and production.

If you are drinking coffee as you read this paper, you are benefiting from the use of 140 liters of water needed to grow and process the coffee in your cup. If you had meat for lunch, you used much more since it takes 16,000 liters of water to produce one kilogram of beef. The world today grows twice as much food as it did in the 1960s, but uses three times more water to grow it. Two-thirds of all the water taken from the environment goes to irrigate crops.

When international trade of food crops or other commodities takes place, there is a virtual flow of water from producing and exporting countries, to countries that consume and import those commodities.

Trade in virtual water allows water scarce countries to import high water consuming products while exporting low water consuming products and in this way making water available for other purposes, according to the WWC "There are many Arab countries, such as Qatar and Bahrain, which entirely depend on virtual water. They do not have

much agriculture and depend on importing most of their food. So, they are relying a lot on virtual water” Dr. al-Hamdi said.

Yemen is still one of the poorest countries in the world. In 2005, the United Nations Development Programme (UNDP) ranked Yemen 151st out of 177 in the List of Countries ordered following the Human Development Index. About 40 percent of Yemen’s population of 20 million lives below the poverty line with less than \$2 per day. The World Bank has noted that the average annual income was only \$450 in 2003, and Yemen’s unemployment rate was close to 40 percent in that same year. Further, according to a UNICEF report, Yemen has the world’s fourth fastest growing population, which will increasingly reduce each person’s available share of fresh water.

“So, the question is: can our economy in Yemen sustain virtual water that enables us to import every drop of water we need? I think it is a very difficult for us,” Dr. al-Hamdi said. “Our economy is not very strong and neither is it our purchase capacity which allows us to import everything we need.”

Despite the lack of arable land, scarcity of water, periodic droughts, and difficult terrain, agriculture is still an important part of the economy. It contributes 21 percent to the Gross Domestic Product (GDP) in Yemen, employs 60 percent of the population, and provides livelihood for rural residents who constitute about 76 percent of the total population.

On the other hand, qat is having a baleful effect on Yemen. Of the country’s scarce water, 40 percent goes to irrigate qat, and qat cultivation is increasing by 10 percent to 15 percent a year.

We actually suffer from water scarcity and because of that, we are put in a position where we have to manage our water in a very careful manner, Dr. al-Hamdi said in an interview prepared for a documentary film on water in Yemen. “We cannot buy stuff from outside; we also don’t have the purchasing capacity. We are not wealthy enough, and we do not have enough water to produce this stuff in our country. Then you can see what a catastrophe is it, how can we sustain life in such country? Eventually, people will start migrating out of this country.”

Introducing the “virtual water” concept in 1993, the British Professor John Anthony Allan from King’s College of the University of London, demonstrated that people do not only consume water when they drink it or take a shower, but also consume much more water when they eat food and drink coffee.

Allan has been awarded the 2008 Stockholm Water Prize for introducing the concept of “virtual water”, since this concept has a major impact on global trade policy and research, especially in water-scarce regions and has redefined the discourse in water policy and management.

Professor Allan pioneered the development of key concepts in the understanding and communication of water issues and how they are linked to agriculture, climate change, economics and politics.

The Stockholm Water Prize, \$150,000 and a glass sculpture are all part of a global award founded in 1990 and presented annually by the Stockholm Water Foundation to an individual, organization or institution for outstanding water-related research.

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