

## **Aral Sea Issues from Virtual Water Viewpoints**

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The Aral Sea basin includes Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. A small portion of its headwater is located in Afghanistan, Iran and China. The basin is formed by two of the largest rivers of Central Asia - Amu Darya and Syr Darya - both fed by the snowmelt and glaciers from the mountains. In 1960, the Aral Sea was the fourth largest inland lake in the world. Since then, however, it has shrunk significantly because of nearly total cutoff of river inflow from the Amu Darya and Syr Darya as a result of heavy withdrawal for irrigation. The main issues relating to the Aral Sea basin area are the following: the reduction of the sea, the destruction of its aquatic ecosystem, the lowering of soil quality in the Aral Sea Basin, pollution of surface and groundwater of the delta draining into the Aral Sea, depressed economy and adverse health impact on the population due to lack of portable water and inadequate sanitation. Of eight basin countries, five former Soviet Union countries have a mechanism, as a river basin organization. The mechanism however does not seem to be functioning. The new challenge these countries now face is political stabilization in the Afghanistan and subsequent increasing consumption of water resources to increase agricultural production in the northern part of the country. The Amu Darya has its source in high mountains in Tajikistan and Afghanistan. Any increase in water consumption within Afghanistan will lead to decrease of water availability in the downstream region. The food production of Afghanistan in these days is nearly one-half of the same in late 1970's. A lot of virtual water has been brought into Afghanistan either by food import or through food aid operation. In case Afghanistan consumes more water in the Amu Darya basin towards food self-sufficiency, downstream countries will have much less water in the same river. What is worse, population of Afghanistan is supposed to increase by 100% in the coming two decades. It implies drastic decrease of flow in the downstream area. These trends of increasing water consumption in Afghanistan may lead to conflicts among basin countries. Apparently some measures should be taken. Such measures may include improvement in water use efficiency in the downstream area, change in economic structure of both upstream and downstream countries. Tradeoffs between real water consumption (food production within the country) and virtual water consumption (import of food from abroad) in Afghanistan should be addressed from the viewpoint of security among basin countries.

Keywords: Afghanistan; Aral Sea; irrigation, virtual water.