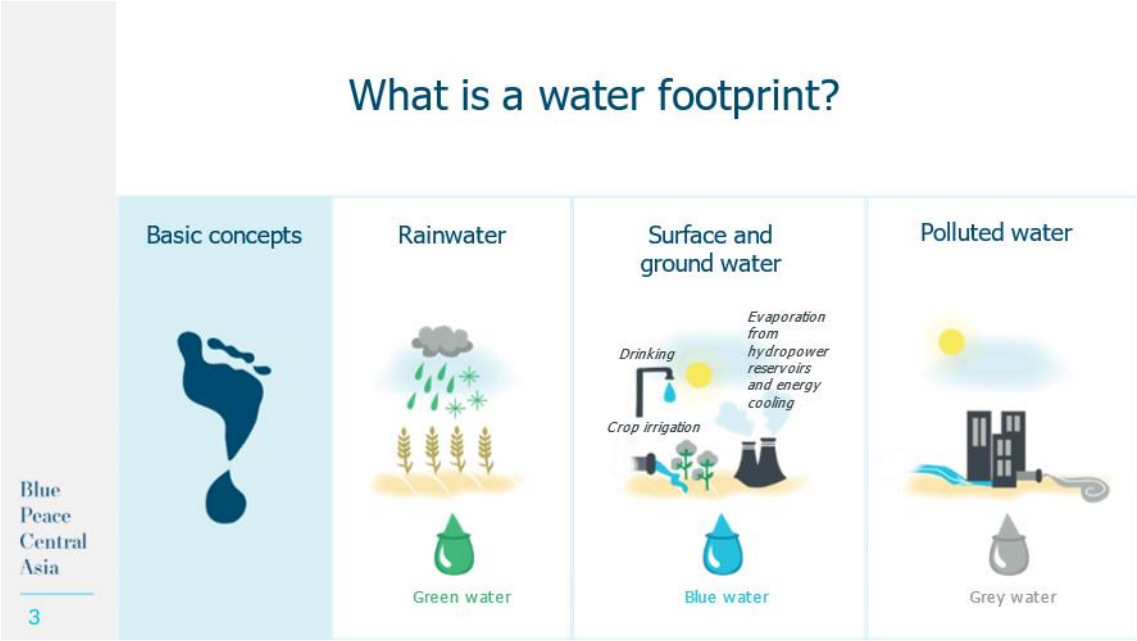
The Water Footprint in Central Asia

The Water Footprint is a measure of the water use for the production of goods and services. The Blue Water Footprint refers to consumption of surface and groundwater, while the green Water Footprint refers to the direct consumption of rainwater. The grey Water Footprint refers to pollution.

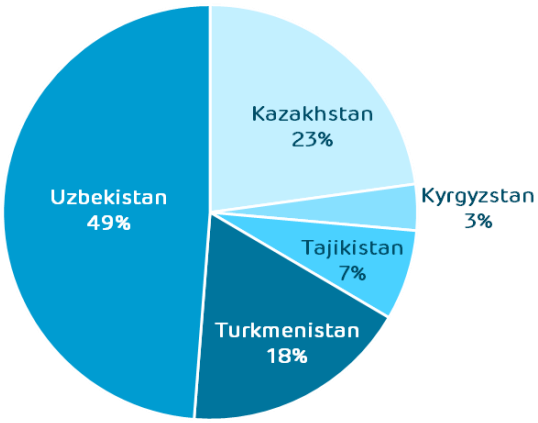


Last year I was involved in drafting the report *Water Footprint Analysis of Central Asia.* It presents the results of one of the first practical applications of the Water Footprint Assessment methodology in Central Asia. The full report with a number of interesting figures and tables can be found here: https://bluepeace-centralasia.ch/materials/water-footprint-analysis-of-central-asia/

The countries covered are Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The results show that agriculture has by far the largest Water Footprint and this sector is the focus of the report. The Water Footprint of agriculture can be reduced significantly by using water more efficiently.

Green water and rainfed agriculture are particularly important in Kazakhstan. A high dependence on green water for production, translates into a high vulnerability to drought. Serious drought in Kazakhstan has a negative impact on the food security of the whole region as the other countries rely on Kazakh rainfed wheat.

Blue water footprint of crop production per country



Blue water use for irrigation is important for all countries with Uzbekistan being the largest blue water user. Cotton is the main crop using blue water according to data from before 2017 but the cultivation has decreased since then. Annual water withdrawal for agriculture is around 68 billion m^3. However, only 33 billion m^3 is consumed by crops (Blue Water Footprint), and close to 50% of the water withdrawn is lost due to losses before the water comes to the field! There are very good opportunities to decrease the waste of water – but this demands investments and policy changes.

The region is a net virtual water exporting region with cotton being the largest blue water export commodity and wheat the largest green water export commodity. The financial return per m^3 of water used for producing and exporting unprocessed crops tends to be low. Trading a primary crop after adding value through processing is generally more profitable not just from a purely economic but also from the point of view of water economic productivity. High-value crops such as vegetables provide a comparably high economic value for water used.

The Water Footprint Assessment for Central Asia identified several opportunities and also concerns. The Water Footprint concept in the region can be used to identify differences in the efficiency of water use — green, blue as well as grey water — between sectors, countries, crops or agricultural systems. Defining regional benchmarks along with follow-up field investigations would increase the understanding of opportunities and bottlenecks for efficient water use.

Among the conclusions drawn by the Water Footprint Assessment, the following can be highlighted:

— Minimizing water losses (for example through investments in infrastructure) can improve the water situation significantly;

— Integration of Water Footprint data with drought modelling could be useful for future production of rainfed agriculture in Kazakhstan;

— Improved stability and trade relations in the region, and an improvement in the dialogue between the countries, would give possibilities for countries to decrease irrigated wheat production that has a low economic benefit per volume of water used;

— The countries of the region should also consider switching part of their production and exports from historically grown irrigated crops to economically more advantageous high-value products such as vegetables and fruits;

— Monitoring the changes in Water Footprints and economic value of irrigation water gives an opportunity to analyse the efficiency of investments and the introduction of new policies with the aim of saving water, and

— An improved, joint understanding of Water Footprints and virtual water trade may facilitate the design of future trade and water cooperation agreements, and contribute to food security and economic development throughout the region of Central Asia.

It is suggested to establish a working group with water policy experts from countries in the region to discuss the next steps for applying Water Footprint methodology in Central Asia.

Bo Libert 23 May 2023