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Switzerland's Water Footprint

Where does the water in our agricultural products come from?



Water canal saturated with salt Chott El Jerid Tunisia

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Summary

Calculating the water footprint

Recent years have seen a consistent drop in water consumption both in Swiss households and in industry. This is a welcome trend, which must be further encouraged. However, the quantities of water consumed in this way are only a small proportion of what we actually make use of each day. A substantially larger proportion is hidden as "virtual" water in our foodstuffs, clothing or other products that we consume or use in our daily life. This is the quantity of water required to manufacture these products. Combined with data about this water's origin, we talk about the "water footprint" (Figure 1).

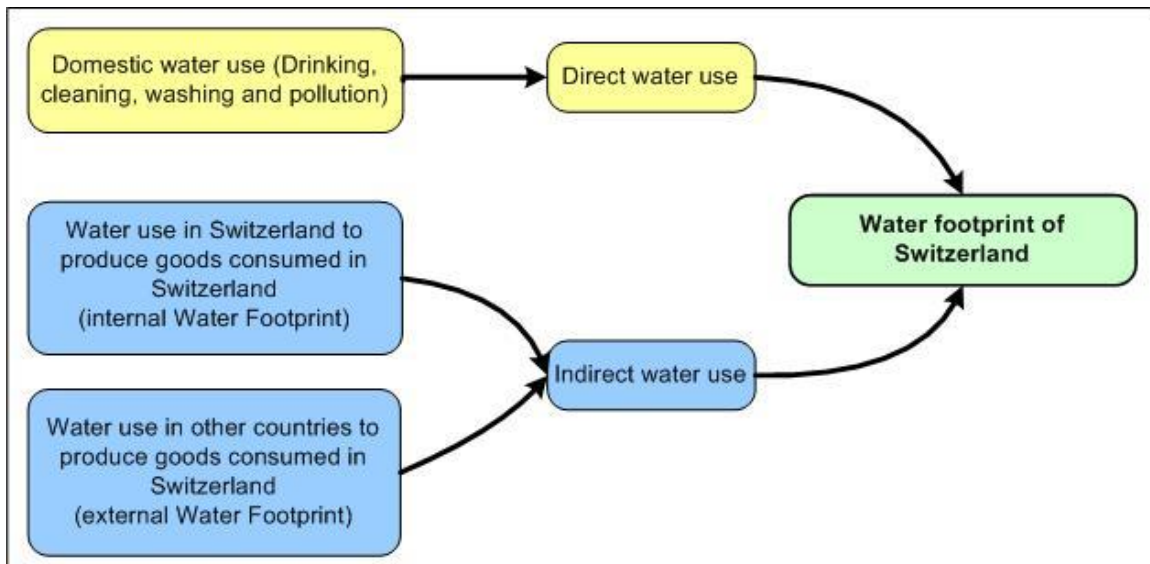


Figure 1: Schematic to establish a water footprint

To date, only estimates of Switzerland's water footprint have been available. The aim of this study was therefore to analyse the country's water footprint, focusing on agricultural products and their countries of origin. At the same time, this evaluation of the wide-ranging data set provides the basis for recommendations for action by governments and businesses in order to reduce the water footprint's environmental, humanitarian and economic impact.

Based on international trade data for plant and animal products and their water consumption, the virtual water content of specific agricultural products was calculated for each country, taking account of its climatic conditions. The quantity of water required to produce all the products manufactured inside and outside Switzerland and consumed in Switzerland is Switzerland's agricultural water footprint. When added to the water that is actually consumed in households, businesses and industry, this gives rise to Switzerland's total water footprint, which amounts to 16.2 km³ of water per year. Each inhabitant of Switzerland thus consumes 6,082 litres of water per day, but only a small proportion of this as drinking water, for cooking or for other household requirements. The majority is in the foodstuffs or products that are consumed daily.

Some 62 percent of Switzerland's water footprint for agricultural goods is contained in imported products or foodstuffs. This means that, by importing these goods, water is also imported in virtual form from the producer country. As a result, Switzerland has left its water footprint there.

The imported goods with the largest water footprint are, in descending order, cocoa, coffee, sugar, nuts, wheat, oilseeds, rice and beef. Switzerland's largest water footprint is in Ghana, the Ivory Coast, Brazil, France, Italy, Germany and Spain, again in descending order (Figure 2).

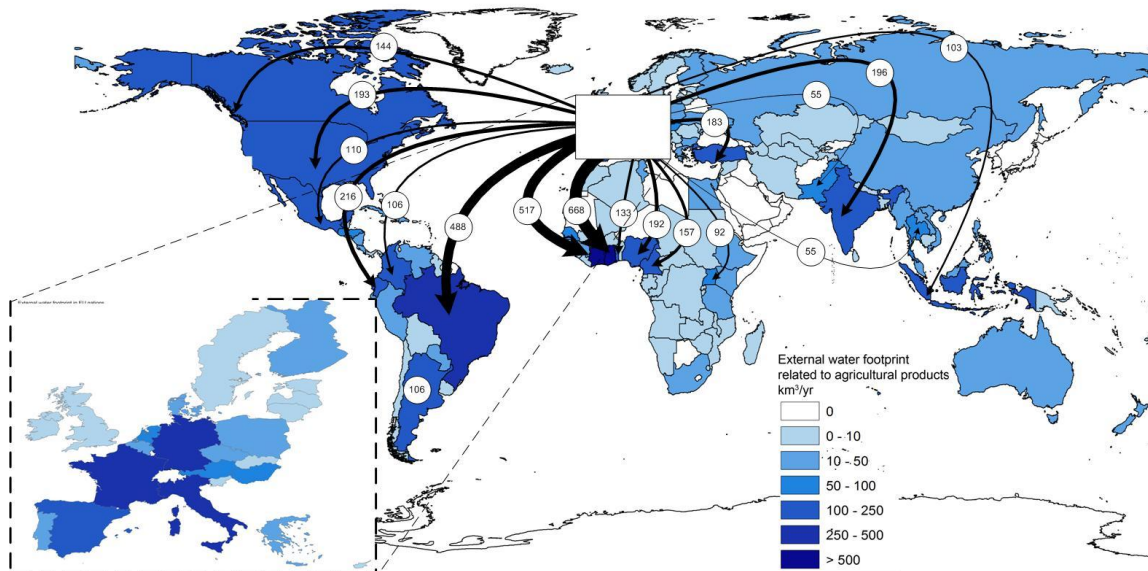


Figure 2: External agricultural Water-Footprint of Switzerland in the world: The highest footprint is left in Ghana, Ivory Coast, Brasil, France, Italy, Germany, Spain, Ecuador, India and the US (descending order).

Switzerland's external water footprint

The severity of the impact of exporting virtual water depends on the regional climatic conditions and production technologies used in the producer country in question, in particular regarding the ever more widespread use of irrigated agriculture. This study examines the cultivation of cotton, nuts, rice and sugar in greater detail in various countries of the world as examples of the impact of producing certain goods.

Different production standards are applied in the producer countries, under various climatic, geographic and economic conditions. By way of example, four countries are presented here in which the export of virtual water, at least in individual regions, has a negative impact on natural ecosystems and on social and economic affairs:

Brazil: Although Brazil is in general a water-rich country, it nevertheless has a considerable problem with its water resources, above all due to massive water pollution from population growth and wastewater from agriculture and fishing, as a result of which the population's drinking water supply cannot be adequately guaranteed. Critical products involving high water consumption are coffee, soy and beef. These are also the products with the largest water footprint that Switzerland imports.

India: India's agricultural sector is shaped very substantially by cotton growing, which, in the northern states with artificial irrigation, has a negative impact on river basins and the environment. Considerable weaknesses in water management also give rise to wide-ranging social and economic problems for the country's rapidly growing population.

Spain and Turkey: The situations in Spain and Turkey are largely similar in terms of cultivation conditions. However, while Spain has in recent years seen a clear turnaround towards more efficient irrigation technologies, in Turkey more than 90 percent of irrigated areas are still flooded. Both Spain and Turkey are major trading partners for the European market, in which Switzerland is also a major trading partner. Particularly serious damage is being done in both countries by illegal water abstraction, which has to date been only inadequately punished by government authorities and attracts neither appropriate sanctions nor deterrent penalties.

Climatic conditions and soil properties determine which arable crops may be cultivated, a factor that severely limits the selection of crop plants in central Europe. Under the given climatic conditions, only one annual harvest is generally possible here, in contrast with an often year-round cultivation cycle in the climatically favoured regions of the tropics and subtropics. In these regions, the limiting factor for producing agricultural goods is not, as in central Europe, the seasons and their associated temperature fluctuations, but instead the availability of and reliable access to water. Artificial irrigation is being used ever more frequently in these regions to overcome this limitation. This is, however, at the expense of the natural water balance and the natural environment, and increases competition with other water users. Already scant national water resources are often used not to secure the country's own supplies, but instead to produce goods for export, which, when imported, reduce the pressure on the importing countries' own resources.

Recommendations for action from the WWF and future prospects

Switzerland's external water footprint accounts for almost two thirds of the country's entire water footprint. Stakeholders not only in Switzerland but also in the countries of origin of the imported products thus have a particular global responsibility to help reduce this footprint. At present, this is primarily a matter for governments and businesses and only secondarily for consumers, since there have to date been only few options for consumers to reduce their personal water footprint by targeted consumption.

We recommend that the governments of the key countries of origin from which Switzerland imports particularly water-intensive products should ensure efficient and legal irrigation of agricultural products not only by incentives, but also by sanctions and penalties.

Moreover, the allocation of water resources, specifically groundwater and surface water, to agriculture and industry must not result in water no longer being available in sufficient quantity or quality for rivers, groundwater resources or wetlands.

By increasing funding for development projects, Switzerland can create incentives in areas where attempts are being made to improve the sustainable management of groundwater resources, in order to exert a guiding and supporting influence there. The same applies to river basins, especially in regions where water is scarce, yet water resources are not being sustainably managed. At a European level, it is important to press for the consistent implementation of the Water Framework Directive for rivers and groundwater bodies, specifically in the Mediterranean countries Spain, Italy and Greece, but also in EU accession candidate country Turkey and further countries around the Mediterranean.

We recommend that businesses track and document their water footprint along their entire supply chains in order to gain a better understanding of the associated risks. In addition, they must reduce the impact of their products above all in those regions that are already suffering

or will in the near future suffer from water shortages. Working together with other businesses, they should support more efficient and sustainable management of water resources to not only provide the inhabitants of these regions with access to water but also ensure sufficient residual flows. Moreover, it is important for businesses to commit to developing water standards that would enable consumers to differentiate between products with a large or a small footprint in critical regions.

WWF is already working towards more efficient water usage in agriculture in some of the key emerging and developing countries that produce many of the products imported into Switzerland (such as Brazil and India), as well as in Europe (in Spain and Turkey, among others) and the USA. Furthermore, WWF actively works together with businesses to develop global water standards for products, to draw up business and risk strategies for dealing with the water footprint, and to help suppliers and exporters implement these strategies in the affected countries.

In short, both water consumption and the demands we place on groundwater bodies and river systems are set to grow dramatically worldwide in the near future. Major factors include the world's growing population and securing the food supply for these growing numbers, together with economic growth and the associated changes in consumption patterns. In China, for example, over the last 50 years ever larger volumes of virtual water have been consumed to feed the country's population, as meat consumption has grown hand in hand with economic wealth. Accordingly, it is all the more urgent that governments, businesses and consumers face up to this responsibility today and invest in better and sustainable water management, for the good of both the local population and of all water-dependent ecosystems, and the future services derived from these ecosystems, which are also crucially important to humankind.

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