

## Water Footprint is a Promising Tool for Water Budgeting in Indian Agriculture

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ARTICLE ID: 98

India is an agrarian country, and climate change is having a major impact on its agricultural production. Water is a major input in agriculture, and quantifying water is an important consideration for improving and minimizing water use in Indian agriculture. Agriculture in India is estimated to consume approximately 78 percent of the country's total freshwater resources. Even though, rains remain vital for more than half of the total cropped area. The major causes of this phenomenon are the highly skewed distribution of scarce irrigation water among crops, as well as inefficient use of the water that is allocated.

Water-intensive crops like rice and sugarcane consume roughly one-fourth of total cropped land. This could lead to a series of challenges among Indian farmers; the main challenges faced by farmers in India were shrinking irrigation water availability and over-exploitation of groundwater. This challenge will become more difficult in the up-coming years. In this situation, precise quantification of agricultural water use is required. The water footprint is a useful tool for quantifying crop water consumption and developing future water-saving strategies. This article's main focus is on the concept of water footprint, different types of water footprints, which are related to Indian agriculture.

### What is a water footprint?

As the volume of water usage is likely to rise, it is important to improve the management and conservation of water. To control and manage water to produce goods and also services, the “water footprint” concept has been adopted. The water footprint of a product is the volume of freshwater used to produce the product, measured at the place where the product was actually produced. It is the sum of water used in all production chain steps.

### Types of water footprint

Water footprints are composed of three parts: green, blue, and grey water footprint. Green water is the water that has evaporated from soil moisture, including through crops, trees,

and vegetation, which is derived from rainfall. Blue water is the water withdrawn from ground or surface water sources, which is supplied through the irrigation. Gray water footprint is the volume of water polluted from the use of fertilizer in the production.

### Green water footprint

Green water footprint is an important component in agricultural practices. Green water is the portion of rainfall that is stored in the form of soil moisture and used by plants for evaporation and transpiration needs. In the agricultural sector, the concept of green water footprint is principally used for rainfed agricultural practice. If a crop's green water footprint is higher, it's a positive indication from the point of conservation of water.

### Blue water footprint

A total of 70 percent of existing global freshwater is withdrawn for irrigation in agriculture. This, however, refers only to water from lakes, rivers, and aquifers (blue water), and does not take into account additional water from rainfall (green water) stored in soil which is used in agricultural production. Simply water applied through irrigation to a particular crop is known as blue water footprint from surface and ground water sources. If the blue water footprint is higher than it will significantly affect the water resources on that region.

### Gray water footprint

Gray water footprint is the amount of fresh water required to assimilate pollutants to meet specific water quality standards. The grey water footprint considers point-source pollution discharged to a freshwater resource directly through a pipe or indirectly through runoff or leaching from the soil, impervious surfaces, or other diffuse. In case of agriculture sector, the major source of gray water footprint is fertilizer application.

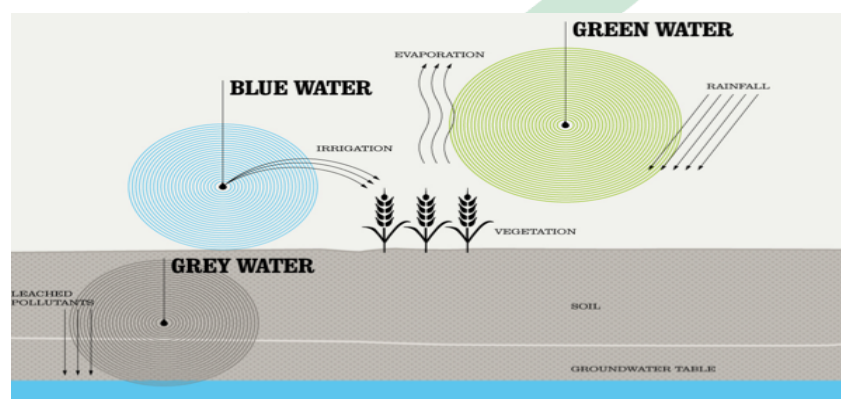


Fig.1. Types of Water Footprint in agriculture

### Conclusion

The water footprint concept is distinct from other methods of water quantification; previous methods only considered a portion of the water abstraction. In the case of a crop production system, the blue water component is the amount of water applied through irrigation, while the green water footprint component is the amount of water taken by the plant through rainfall. Similarly, the grey water footprint is the amount of water polluted as a result of the production of a specific crop. So the WF provides an overall picture of water use in various ways for the production of a specific crop, and it can be useful for policymakers and people involved in the water management sector to know which sectors must provide water.

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