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“Bridging the gap between increasing knowledge and decreasing resources”

## Water Footprint of Cotton Production in China

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### Abstract

Cotton is globally the most important agricultural trade commodity, with China being the number one producer and consumer of cotton fiber. Cotton plays a strategic role for China's current economic development. Apart from being the essence for its textile industry, cotton production also offers high income possibilities for farmers in rural China, however often at the expense of severe natural resource degradation. The Tarim Basin (TB) in north-western China is one of the country's most important cotton production regions, accounting for about one fourth of national cotton production. In this extremely arid region overexploitation of water resources has led to severe degradation of natural riparian ecosystems in the last decades. The present study therefore aims to assess the field gate water footprint of cotton under current and improved production conditions. The analysis builds on a primary farm data set of detailed crop management data from the region. Applying a partial life cycle analysis (LCA) approach the study distinguishes between three types of consumptive water use; 1) green water: evaporated rainwater for cotton growth, 2) blue water: withdrawal of ground- or river water for irrigation purposes, and 3) grey water: water polluted through application of agricultural chemicals during growth. Four representative farm types were identified; i) flood irrigation – low yield, ii) flood irrigation – high yield, iii) drip irrigation – low yield, and iv) drip irrigation – high yield. It is shown that the choice of irrigation technology actually has a lower impact on product water footprint compared to yield level. It is therefore recommended to also focus on improving overall crop management instead of the sole promotion of drip irrigation technology.

**Keywords:** Cotton, water footprint, Xinjiang, China