

HR water consumption marginal benefits and its spatial–temporal disparities in Henan Province, China

Subing Lü^{a,b}, Huan Yang^a, Fuqiang Wang^{a,b,c,*}, Pingping Kang^{a,b}

^aNorth China University of Water Resources and Electric Power, Henan Province 450046, China, email: wangfuqiang@ncwu.edu.cn (F. Wang)

^bCollaborative Innovation Center of Water Resources Efficient Utilization and Support Engineering, Henan Province 450046, China

^cHenan Key Laboratory of Water Environment Simulation and Treatment, Henan Province 450046, China

Received 7 November 2017; Accepted 4 February 2018

ABSTRACT

Water is one of the essential resources to production and living. Agriculture, industry, and living are considered as the direct water consumption. This paper employs the concept of marginal product value to estimate the water consumption marginal benefits in Henan Province. We use data on agricultural water consumption, industrial water consumption, and domestic water consumption of 18 cities in Henan Province surveyed from 2006 to 2013 and considered the Cobb–Douglas production function. The results showed that, during the study period, except for the marginal benefit of agriculture in high developed area, the industrial and domestic water use increased, and the industrial and domestic water use benefits were much higher than agricultural. At the same time, the benefit of the developed area was higher than the developing area. The benefits of agricultural water consumption and industrial water consumption in high developed area have made great improvements gradually, while benefits in low developed area have made small changes; but the benefits of domestic water consumption presented the opposite trend. For the moment, the water consumption marginal benefit still has climbing space. The results are needed for determining the ways in which scarce water resources could be assigned to different areas and sectors.

Keywords: Marginal benefit; Cobb–Douglas production function; Temporal–spatial difference; Henan Province

* Corresponding author.