

Estimation of the rice production in the early 20th century of China: its explanation and impact in both hydrological and historical ways

*CHANG LIU¹, Akiyuki KAWASAKI¹, Tomoko SHIROYAMA²

1. Department of Civil Engineering, The University of Tokyo, 2. Graduate School of Economics, The University of Tokyo

Because of the wide consumption and transportation, rice has played an essential role in the economic development of China in the early 20th century. However, despite of its importance, the rice production was uncertain in most regions at that time because of the confusing management and statistical mistakes of the state bureaucracy. Therefore, to give a reasonable estimation of the rice production, we proposed a new approach combining numerical models and historical documents. In this study, the Water and Energy Budget-based Distributed Hydrological Model (WEB-DHM) was applied to reconstruct the long-term hydrological condition in the early 20th century of China. Then an AquaCrop scheme was used to estimate the potential rice production. Finally, the result was validated according to the historical records of Jiangxi Province. This study showed a reasonable rice production change regarding the 1931 flood and 1934 drought and a possible impact on economic development afterwards. It also suggested a great potential of utilizing the same approach in other monsoon regions in Asia.

Keywords: rice production, historical hydrology, WEB-DHM, AquaCrop