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ScienceDirect
Journal of Integrative Agriculture
2014, 13(7): 1565-1574
July 2014
RESEARCH ARTICLE

Climate Change Impact and Its Contribution Share to Paddy Rice Production in Jiangxi, China

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Abstract

In the study, an improved approach was proposed to identify the contribution shares of three group factors that are climate, technology and input, social economic factors by which the grain production is shaped. In order to calibrate the method, Jiangxi Province, one of the main paddy rice producers in China was taken as an example. Based on 50 years (1961-2010) meteorological and statistic data, using GIS and statistical analysis tools, the three group factors that in certain extent impact China's paddy rice production have been analyzed quantitatively. The individual and interactive contribution shares of each factor group have been identified *via* eta square (η^2). In the paper, two group ordinary leasr square (OLS) models, paddy models and climate models, have been constructed for further analysis. Each model group consists of seven models, one full model and six partial models. The results of paddy models show that climate factors individually and interactively contribute 11.42-15.25% explanatory power to the variation of paddy rice production in the studied province. Technology and input factors contribute 16.17% individually and another 8.46% interactively together with climate factors, totally contributing about 25%. Social economic factors contribute about 7% of which 4.65% is individual contribution and 2.49% is interactive contribution together with climate factors. The three factor groups individually contribute about 23% and interactively contribute additional 41% to paddy rice production. In addition every two of the three factor groups also function interactively and contribute about 22%. Among the three factor groups, technology and input are the most important factors to paddy rice production. The results of climate models support the results of paddy models, and display that solar radiation (indicated by sunshine hour variable) is the dominate climate factor for paddy rice production.

Key words: climate change, food security, paddy rice production, contribution share, China

INTRODUCTION

It has already been a global consensus that climate factors and their changes play an important role in agriculture (Lin *et al*. 2007; Wang *et al*. 2009; Yang *et al*. 2010, 2011), especially in grain production which is the most essential sector for feeding a population over six billion all over the world. Among the rich literature

Received 11 September, 2013 Accepted 20 February, 2014
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doi: 10.1016/S2095-3119(14)60811-X