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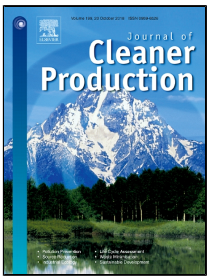

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CO_2 Emissions and Poverty Alleviation in China: An Empirical Study Based on Municipal Panel Data

Gui Jin[a,b], Rao Fu[a], Zhihui Li[b,c,d*], Feng Wu[b,c,d], Fan Zhang[b,c,d]

[a] Faculty of Resources and Environmental Science, Hubei University, Wuhan 430062, China

[b] Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing 100101, China

[c] Center for Chinese Agricultural Policy, Chinese Academy of Sciences, Beijing 100101, China

[d] University of Chinese Academy of Sciences, Beijing, 100049, China

Abstract: Industrial transition and climate change regulation to reduce CO_2 emissions will affect employment and further influence social poverty. In this study, we measured CO_2 emissions and the poverty-alleviation index based on socio-economic and energy consumption statistic data from 286 municipal cities in China for 2007–2014; analyzed relationships between CO_2 emissions, employment rate, and poverty-alleviation index using simultaneous equations; and interpreted the mechanism by which CO_2 emissions influence social poverty at the municipal level. The results indicate that average CO_2 emissions from China increased by 32.9%, with a rapid initial rise and then steady growth from 2007 to 2014, while the average poverty-alleviation index increased by 25.19% during the same period. CO_2 emissions had a significant positive relationship with employment rate in all industries. In addition, employment rate was negatively correlated with poverty-alleviation in primary industry and positively correlated with poverty-alleviation in non-agricultural industry. Studying the mechanisms for CO_2 emission impacts on poverty-alleviation can provide important references for adapting to global climate change, promoting sustainable development, and safeguarding the legitimate development rights of all countries, especially developing countries.

Keywords: CO_2 emissions, climate change, social poverty, influencing mechanism, simultaneous equations, China

1. Introduction

Poverty alleviation and CO_2 emissions reduction are two of China's ongoing strategic missions. Poverty alleviation assists poor households and areas by improving skills and income through physical infrastructure construction, social development, and industrial development, which will help China achieve its goal of comprehensive poverty elimination in 2020 (Liu et al., 2016). To reduce CO_2 emissions in the context of Paris Agreement, China has submitted its Intended Nationally Determined Contributions towards achieving the goals by 2030 as follows: China's CO_2 emissions per unit GDP will be 60% lower than 2005, the proportion of non-fossil fuels in total energy consumption will increase to around 20%, CO_2 emissions will reach its peak in 2030, and carbon storage in forest reserves will increase 4.5 billion cubic meters (Deng et al., 2009; Deng et al., 2012; Schreurs, 2016). Poverty alleviation and CO_2 emissions reduction are closely related (Bai et al., 2017; Chen et al., 2017; Glomsrød et al., 2016). Working Group III in the IPCC Fifth Assessment Report (IPCC AR5) indicated that resolving climate change issues within the framework of sustainable development needs to contain social-economic-environmental integrated goals to ultimately maximize the synergies of the three. In the process of climate change mitigation,