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Climate Change Effects on Farmer's Economic Performance. A Systematic Literature Review

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Abstract. The agricultural sector is the most vulnerable to the effects of climate change, as the effects are differentiated over time and space and can lead to various damages in agricultural sector. Most research findings conclude that negative meteorological events contribute to week economic returns of farms, while some authors challenge these results, and others even assume positive effects. The purpose of this paper is to complement and extend previous literature reviews on economic efficiency, analysing the effects of different methodologies and study-specific characteristics on agricultural sector.

In this paper, we systematically reviewed articles published by peer-reviewed journals which discuss the relationship between climate change and economic efficiency of farms. The search for papers was conducted through the main scientific databases such as EBSCO search, ScienceDirect and Springer, using the most relevant keywords and Boolean operators. Based on the PRISMA recommendations, we developed a six step protocol to assess the international embeddedness of this topic, as well as the geographic extension of existing knowledge, the key findings of literature and the types of data, data sources, sample sizes and sample units used by the researched studies. In specific case of studies using Data Envelopment Analysis we extracted the inputs and outputs used in selected studies and average technical efficiency score obtained by studies.

Based on the reviewed articles, we found that economic efficiency of agricultural processes are most vulnerable to the extreme climatic events, the changes of plant production and animal breeding development stages, climate perception and coping with climate change of the human resources, the changes of environmental and abiotic conditions and farm characteristics. We conclude that the literature on climate change is growing rapidly, the majority of literature are conducted on farm level (instead of country, household, or region) and the international research are focusing mainly on United States and western part of Europe.

The further approach for investigating the link between the climate change and efficiency of farms relies on meta regression to evaluate the effect of methodological and other study-specific characteristics on published empirical estimates.

Keywords: agriculture, crop production, climate change, systematic review