

Prediction Model and Demonstration of Regional Agricultural Carbon Emissions Based on PLS-SA-AdaBoost: A Case Study of Fujian Province, China

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Abstract

The prediction of regional agricultural carbon emissions is of great significance to regional environmental protection and sustainable development of regional agriculture. This paper puts forward a combined prediction model integrating Partial Least Squares (PLS), Simulated Annealing (SA) and Adaptive Boosting (AdaBoost) to predict regional agricultural carbon emissions, which overcomes the shortcomings of insufficient accuracy of a single model prediction. This paper conducts a demonstrative study on the agricultural carbon emissions in Fujian Province, China to verify the feasibility and effectiveness of the PLS-SA-AdaBoost combined prediction model. The experimental results show that PLS-SA-AdaBoost combined prediction model has a higher precision than SA-AdaBoost model and PLS-SA-AdaBoost model; meanwhile PLS-SA-AdaBoost combined prediction model shows obvious advantages compared with other combined prediction models. In terms of five different scenarios, the paper adopts PLS-SA-AdaBoost combined prediction model to predict the future trend of agricultural carbon emissions in Fujian Province.

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