



# Incentive mechanism to promote corn stalk return sustainably in Henan, China

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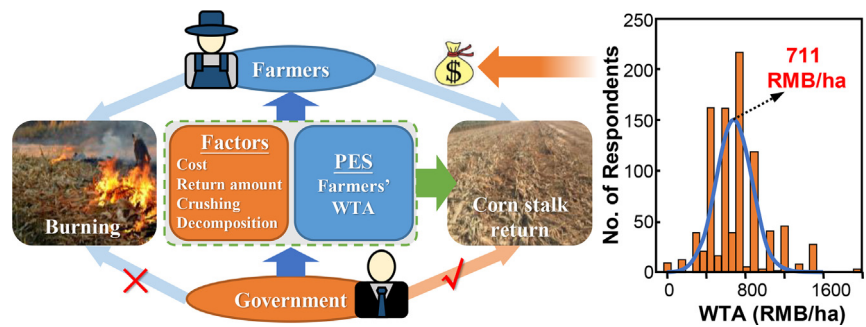
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## HIGHLIGHTS

- Corn stalk return (CSR) declines farmers' willingness to participate with the extra production cost.
- 45% of surveyed farmers are passive in CSR.
- Farmers' willingness to accept (WTA) compensation for CSR is 711 RMB/ha.
- Low machinery cost and rapid decomposition in CSR contribute to high participation and low WTA.

## GRAPHICAL ABSTRACT



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## ABSTRACT

Corn stalk return (CSR) can manage agricultural residues on the spot to avoid field open burning and protect the environment. However, the implementation of this measure encounters reluctance from farmers which hinders its sustainability. This study combined the economic (cost) and technical (return amount, crushing quality, and decomposition of corn stalk) aspects to examine the factors affecting farmers' willingness to participate in the CSR by using a logistic regression model. The level of willingness to accept (WTA) compensation and its determinants were analyzed by using a tobit model. Based on the survey of 925 farmers, this study found the likelihood of farmers' participation in CSR will be decreased when CSR has high machinery cost, an excessive amount of stalk, poor quality of crushing, and slow decomposing rate. The farmers' WTA for CSR was estimated at about 711 Chinese Yuan (RMB) per ha annually, much higher than the current compensation level of 75–225 RMB per ha in Henan. Farmers were willing to be compensated more because of the high cost and slow decomposing rate. The issues in economic and technical sides should attract more attention, and the compensation should be increased and the technical problems should be solved to stimulate farmers' willingness of CSR. By providing a fuller understanding of farmers' CSR behavior, this study can serve as a reference for the Chinese government to develop and implement better policies.

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## 1. Introduction

Crop straw burning significantly contributes to daily and annual PM<sub>10</sub> in urban areas and results in negatively affecting urban air quality in China (Liu et al., 2020). In recent years, actions of direct crop straw return are

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