



Research article

Determinants of rice farmers' intention to use pesticides in eastern India: Application of an extended version of the planned behavior theory

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ABSTRACT

Farmers' health and the environment are prime priorities for any agrarian economy. In India, almost 90% of the pesticides are used in rice, cotton, and vegetables. Nevertheless, factors associated with farmers' behavior in pesticide use are lacking. This study assessed Indian rice farmers' intention to use pesticides, by applying a modified version of the theory of planned behavior with knowledge of pesticide use and moral norms as additional constructs. The study is marshaled by the primary data collected from 480 rice growers of Odisha region, India through a multi-stage random sampling. The majority of the farmers showed positive attitudes towards pesticide use, relatively high levels of subjective norms, and almost neutral levels of moral norms. On the contrary, the majority of the farmers exhibited quite low levels of perceived behavioral control and knowledge of safe pesticide use. A significant positive correlation was established between intention and the variables attitudes, subjective norms, moral norms, perceived behavioral control, and knowledge. Knowledge was the most significant variable in controlling subjective norms, moral norms, and intention, while subjective norms and moral norms also played a crucial role in intention. Findings highlight the crucial role of knowledge, subjective norms, and moral norms in intention to use pesticides. Policy initiatives need to be implemented in the study area for judicious pesticide use, including integration of scientific knowledge about pesticide use with farmers' traditional pest management and establishment of a strong link between rice farmers and extension experts, who can encourage 'pesticide-free' farming through proper certification programs.

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1. Introduction

Plant pests are known for causing significant losses on crop production throughout the world (Damalas, 2016; Jena et al., 2018). Various management strategies, like host plant resistance, physical barriers, botanical pesticides, biological control, biotechnological approaches, and synthetic pesticides have been developed to

tackle the pests, but the most widely used technique under field conditions is the chemically based management. Synthetic pesticides are mostly used against pests in the field due to their capability and high reliability in protecting crops and thus ensuring high crop yields. Recent reports suggested that still 5 billion kg of pesticides are used in the agricultural fields throughout the world even after introduction of novel molecules, like diamides, oxadiazines, neonicotinoids, which have higher efficacy against insects with lower dosages (FAO, 2020). In a nutshell, among different continents, South America ranks first in pesticide usage estimated to 5.42 kg/ha, followed by Asia (3.67 kg/ha), North America (2.51 kg/ha), Oceania (2.09 kg/ha), Europe and Africa (0.29 kg/ha) (FAO, 2020). Modern farming systems have already included pesticides as a key component of crop production, but pesticides also associated with serious problems like development of pest resis-

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