

Peer Review

Review of: "Biopesticide Market and Regulatory Landscape with Determinants of Farm-Level Use in India"

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Please address the following comments:

According to the data, biopesticide consumption is growing slowly despite the great advantages for the environment and ecosystems that they provide. For the authors, could more specific policy interventions – e.g., targeted subsidies, farmer awareness programs, and market-driven incentives to accelerate adoption – be discussed? Moreover, a consideration of the implications for predicted economic and ecological costs would tremendously increase the study's real-world relevance.

The study also shows that India experiences significant regional disparities in biopesticide usage. More broadly, could the authors provide more discussion of the socio-economic, agronomic, and infrastructural reasons behind these differences? Understanding how customised policies can address these gaps would provide useful policy recommendations to stakeholders.

Although the manuscript mentions the regulations briefly, it would benefit Indian biopesticide regulations to compare them with EU and Brazil regulations. What adjustments could India's regulatory framework afford to be innovative, safe, and easy to adopt without imposing an extreme burden on small-scale producers?

Cost is still said to be the main roadblock to adoption, according to the study. Have the authors considered the economic sustainability of biopesticides within current agricultural systems? Additionally, this discussion could be enriched by an examination of the effects of global and local market forces on price and availability.

Despite stressing the environmental advantages of biopesticides, the manuscript lacks a proper numerical assessment of their sustainable impact on ecosystem services, biodiversity, and human wellbeing with regard to similarity with chemical pesticides.

Technological advancements in biopesticide formulations are continually referred to in the paper. Can the authors clarify particular improvements, for instance, the application of nanotechnology, genetic manipulation, or other novel delivery methods, that improve biopesticide efficacy and how they can enable scaling?

The SUR model identifies a range of determinants of the adoption of biopesticides. Would the authors clarify their discussions on the intersection of demographic variables like gender, education, and household size with cultural or traditional practices? This may allow for an understanding of the factors driving farmers and their decision-making processes to a greater degree of nuance.

Integrating biopesticides into IPM: Biopesticides are certainly integrated with IPM; however, a thorough assessment of their current roles in IPM options in India would be beneficial. Are there easily documented success stories or pilot programs delivering scalable results?

Public-private initiatives to promote biopesticides: What specific models or examples like PPPs or cooperative models can be proposed and explored for deployment at a grassroots level?

Declarations

Potential competing interests: No potential competing interests to declare.