

# **Farmer Perception and Demand for Pesticide in Rice Cultivation of Sri Lanka**

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Research Report No: 212



November 2017

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**First Published: 2017**

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Final typesetting and lay-out by: Niluka Priyadarshani de Silva

ISBN: 978-955-612-234-3

**Suggested citation:** Munaweera, T.P. and Jayasinghe, J.A.U.P. (2017). Farmer Perception and Demand for Pesticide in Rice Cultivation of Sri Lanka. HARTI Research Report No: 212, Hector Kobbekaduwa Agrarian Research and Training Institute, Colombo, Sri Lanka.

## EXECUTIVE SUMMARY

Chemical pesticides are widely used across the globe in the management of pest and diseases in agricultural production. However, there is an increasing concern about the adverse effects associated with this use on public health and the environment. Even though the negative externalities associated with pesticides are evident, farmers use pesticides at increasing trend because marginal increase in pesticide use still appears to be profitable to farmers compared with other alternative pest and disease control methods. Paddy farmers in the country also use and misuse pesticides without paying much attention to adverse effects associated with it. Since rice cultivation is important to the country in terms of economic and social perspective, future sustainability of paddy farming has become a major concern.

The major objective of this study is to assess the pesticide usage and farmer perception on pesticides (insecticides, weedicides and fungicides) in rice sector by analysing economic and non-economic determinants of adoption and level of pesticide use decision on rice farmers in Sri Lanka. In this study determinants of adoption and level of pesticide use are explored using a comprehensive data set collected from 240 randomly selected rice farmers from selected areas in the Anuradhapura, Ampara, Matara and Kurunegala districts.

This study employs the cross sectional Double Hurdle Model that describes demand decisions on pesticide arising from two hurdles that have to be overcome for positive demand to be observed. The first of the two hurdles is the decision to participate in the market and the second is the decision on the quantity to purchase. Probit procedure was employed for the adoption stage and Tobit procedure for the level of use stage. The advantage of using Double-Hurdle Model is it allows separate analysis of what determines the adoption and level of pesticide use.

The study found that most commonly used type of pesticide in rice cultivation in Sri Lanka irrespective of the agro-ecological and type of irrigation variation is herbicides followed by insecticides and fungicides. About 77 percent of farmers apply herbicide prior to emergence of weeds as a routine practice starting from the day of planting. Around 33 percent of farmers use more than the recommended dosage as they believe that

recommendations and prescriptions given in the pesticide product label are not appropriate.

DH model analysis results broadly reveal differences in the key drivers of the adoption and use decisions. Household size, farming experience, type of irrigation, training received related to pest control and extent under cultivation are the common variables that have significant effect on the decision on adopting or non-adopting the insecticides and herbicides. On the other hand, age, sex, extent cultivated, farm gate price, tenorial status, type of irrigation and training related to pest control can be identified as common variables affecting the quantity of active ingredients of insecticides and herbicides applied.

Overall, the findings highlight the complexity of the issue, with different variables influencing decisions about whether to adopt pesticides at all, and if so the right amount. The insights generated should be of value to agricultural extension agents, researchers and policymakers. They reveal that decisions about pesticide adoption and use are complex, depending on a range of variables. Institutions seeking to curb the overuse of pesticide or to encourage adoption of alternative methods of pest control need to use multiple strategies to address the key variables.

Most of the issues at the user's level are associated with lack of awareness, poor attitudes and behaviours of farmers. Thus, urgent efforts should go into persuading farmers to handle and use pesticides correctly via effective awareness campaigns through all possible means including print and electronic media. Based on the influential factors identified government and law enforcing authorities should develop and implement policies to regulate the pesticide use in Sri Lanka.

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