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Managing catastrophic risks in agriculture: Simultaneous adoption of diversification and precautionary savings

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ABSTRACT

The use of multiple risk management tools at the same time is a common practice among the farming communities around the world. However, most of the previous studies ignored the correlation among the risk management adoption decisions and the potential for simultaneous adoption of the risk management tools. This study is therefore, designed to investigate the impact of farm and farm household characteristics, farmer's perceptions of catastrophic risk sources and farmer's attitude towards risk on their decisions to adopt diversification and precautionary savings to manage farm risk keeping in view the possible correlation between the risk management adoption decisions using a bivariate and multinomial probit models. 330 respondents are randomly selected from Khyber Pakhtunkhwa Province of Pakistan using a multistage sampling technique. The results confirmed the correlation between the risk management adoption decisions and revealed that adoption of one risk management tool may make it more likely to adopt the other risk management tool at the same time. Moreover, the results also highlighted the role of age and education of the household head, monthly household income, land ownership status and risk averse nature of the farmers on the decisions to adopt diversification and precautionary savings to manage farm risks. The use of both bivariate and multinomial probit approaches provides richer interpretations, better inferences, and more information that may further improve understanding of the risk management decisions of farmers and will help policy maker to better anticipate which farmer will adopt government support risk management tool in the presence of traditional risk management tools.

1. Introduction

Agricultural activities are subjected to a wide range of risks and uncertainties because of the variable economic and biophysical environment in which farming operates. The uncertainty concerning outcomes that involve some adversity or loss that negatively affects individual well-being is normally associated with the idea of risk [25]. Previous literature finds a more useful distinction between uncertainty as imperfect knowledge and risk as exposure to uncertain unfavorable economic consequences [14]. There are various sources of risk associated with farm enterprise. Musser and Patrick, [24] follow Baquet et al., [6] and listed five main sources of risk in agriculture namely production risk, marketing risk, financial risk, legal and environmental risk and human resources risk. Among the major risks farmers face is production risk. Agricultural production is riddled with risks that can adversely affect production levels and lead to sizeable losses [12]. Weather is commonly recognized as a dominant production risk source in agriculture. Extreme natural hazards such as floods, droughts, cyclone and storm surges, hails storms, etc. farmers have little to do against such natural calamities and they are mostly uncertain. Since production output is the main source of revenue for agricultural operations, it is important for farmers to recognize and manage production risk [12] Figs. 1–4.

Managing uncertainties and risks in agriculture is crucial as it affects other sectors of the economy [17] and is generally considered as a key matter in farmers' decision-making and to the policies that affect these decisions [30]. Farmers have number of options available to manage farm risk and many of them use these risk management tools simultaneously [38]. However previous studies on factors affecting the adoption of risk management tools

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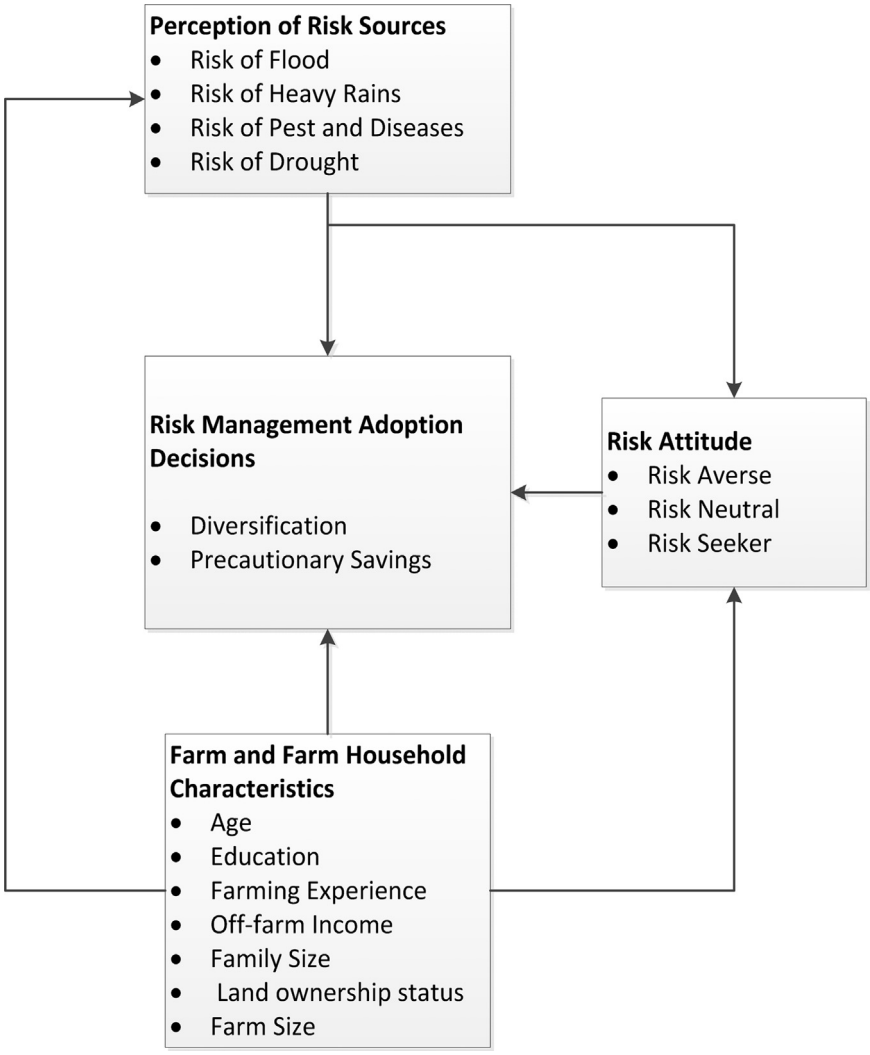

Fig. 1. Conceptual framework.

ignored the potential for simultaneous adoption of multiple risk management tools and analyze factors affecting the adoption of a single risk management tool and/or considered the decisions of adopting multiple risk management tools independent. Velandia et al. [38] is an exception in this case however, Velandia et al. [38] analyzed factors influencing the adoption of crop insurance, forward contracting and spreading sales to manage business risks in agriculture. Agricultural insurance is relatively underdeveloped in Pakistan [13, p.189]. Crop Loan Insurance Scheme (CLIS) has been introduced in Pakistan since 2008 however, majority of farmers are unaware of the scheme and stick with the traditional techniques to management risk at farm. This study is therefore, designed to investigate farmers' decisions of using traditional risk management tools (i.e. diversification and precautionary savings)

Fig. 2. Map of Pakistan.