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Role of network for diffusion and adoption of climate-smart agriculture technologies in Bangladesh

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Abstract

This study aims to unravel the intricate network measures underlying the diffusion and adoption of Climate-Smart Agriculture (CSA) technologies. By conducting personal interviews with both Common Interest Group (CIG) and non-CIG farmers, the researcher gathers rich data on the key actors involved in the diffusion process in the northern Bangladesh. The data analysis for the network visualisation was done by Gephi software. Pearson's correlation of coefficient was estimated to explore the centrality measures that can significantly affect the adoption of CSA technologies by SPSS (Statistical Packages for Social Science) software. The findings reveal compelling insights into the structure and functioning of diffusion networks for CSA technologies. Central actors within these networks emerge as influential figures, playing pivotal roles in disseminating knowledge and catalyzing adoption among their peers. Interestingly, the study uncovers variations in network characteristics and influential actors across different CSA technologies, underscoring the importance of context specificity in adoption dynamics. From network analysis, it is observed that centrality position is a strong predictor of who adopts the different CSA technologies. Active and frequent communication with leaders, early adopters, and lead farmers identified as central actors driving CSA technology diffusion and adoption. Nevertheless, network of farmers is particularly relevant in case of adoption decision for a particular CSA technology, as incentives to use a new crop variety or a fertiliser or a practice are more compelling, if they are connected to potential peers in their network. The results highlight the role of social networks in shaping farmer's adoption decisions, as connections to influential peers and access to relevant information significantly influence the CSA adoption. Overall, the findings show the intricate interplay between social networks and CSA technological adoption, emphasising the need for targeted interventions that leverage existing social structures to promote CSA uptake effectively.

Keywords: Bangladesh, climate-smart agriculture, diffusion and adoption, network, role