

Coordination and Impact of Agrifood Value Chains on Farm Performance: Evidence from Smallholder Rice Farmers in Northern Ghana

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Agrifood value chains in developing countries including Africa have been undergoing rapid transformation driven by continued population growth, rising urbanization, increasing incomes, shifts in consumer dietary requirements and demand for quality food. Although this transformation presents considerable opportunities for smallholder farmers, their integration into these value chains still remains a major challenge due to myriad constraints including, but not limited to, high transaction costs associated with inputs and output markets, inadequate access to inputs, finance, and services such as extension and transportation. However, horizontal and vertical coordination have been recognized as effective mechanisms for smallholder farmers' participation in these chains. They serve as avenues for increasing bargaining power, sharing risk, reducing transaction costs, and ensuring economies of scale, as well as smallholder access to services such as inputs and technologies, extension, credit, and output markets. This study therefore contributes to the growing literature on agrifood value chains by exploring the role of these mechanisms on the production and market performance among smallholder farmers in northern Ghana. In particular, the study first examines the impact of vertical coordination mechanisms-written contracts, verbal contracts and spot market transactions – on farm performance outcomes such as net farm income, total farm income, total household income, labor productivity and price margins, using multinomial BFG model to account for selectivity bias. Second, the study employs an endogenous switching regression model to examine the impact of farmer groups and collective marketing on farm net revenues of smallholder rice farmers. It also examines the relationship between farmer group and collective marketing participation decisions. Third, propensity score matching and sample selection stochastic production frontier approaches are employed to examine the impact of farmer groups on farm yields and technical efficiency of smallholder farmers. Finally, the study also explores the role of inclusive value chains and social networks on smallholder market performance outcomes: prices received, quantity of paddy sold and net returns, using a treatment effects model to account for selection bias stemming from observed and unobserved factors. The empirical results reveal that participation in vertical coordination mechanisms is associated with increased farm performance outcomes relative to spot market transactions, with the highest gains stemming from written contract participation. Moreover, access to credit, association membership and labor significantly influence vertical coordination participation decisions. Furthermore, farmers who are members of farmer groups and participated in collective marketing obtained higher output prices, and also incurred lower input costs. The empirical results also show that farmer group and collective market participation decisions are significantly influenced by mobile phone ownership, access to credit, distance to markets and road status. Also, farmers who participated in farmer groups and collective marketing earned significantly higher farm net revenues than non-participants. The study further reveals that farmer groups play significant role in improving farm yields and technical efficiency, relative to farmers who produce and market paddy individually. The positive impacts of inclusive value chains and social networks on smallholder market performance have also been revealed by this study. Inclusive value chain participating farmers received significantly higher paddy prices, traded higher quantities of paddy and earned higher net returns, compared to non-participants. Similarly, farmers who are members of horizontal social networks benefit from improved market performance. The estimates further reveal that inclusive value chain participation decisions and market performance outcomes are significantly influenced by social networks, distance to markets, mobile phone ownership and access to credit. These findings call for development policy measures to promote contractual engagement in smallholder output transactions, formation and development of farmer groups and encouraging collective marketing, as well as strengthen social networks for improved value chain competitiveness and efficiency.