Title: From Language to Action: A Review of Large Language Models as Autonomous Agents and Tool Users

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Abstract: This study examines the factors influencing food security and dietary diversity among rural farming households in Bangladesh, focusing on strategies small farmers can adopt to tackle food security challenges. Using data from a survey of 399 households, food insecurity is evaluated through the Dietary Diversity Score (DDS) and the Household Food Insecurity Access Scale (HFIAS). These measures are crucial for assessing the food security of small-scale farmers. The study shows how DDS captures food quality beyond calories, and how HFIAS reflects hunger experiences and food insecurity severity beyond production. The findings reveal that 61% of households are food-secured, while 39% experience varying levels of food insecurity. The average DDS score of 6.2 indicates diverse diets. Positive factors influencing DDS include income diversification, crop diversification, and farm size, while larger household size and distance to markets negatively affect food security. Crop diversification and access to agricultural information reduce food insecurity, as shown by HFIAS. Regression analysis confirms that higher income diversification, larger farm size, and smaller household size promote food security, while larger household size and greater market distance worsen it. This study calls for policies targeting food security and dietary diversity improvements among small farming households in rural Bangladesh.

Key words: Bangladesh crop diversification Crop Diversification Index food security income diversification multinomial logistic regression ordinaryleast square Simpson Diversification Index small scale farmers

https://doi.org/10.1007/s10462-025-11471-9