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Exploring technical efficiency in Bangladeshi dairy farms: Uncovering regional and market disparities

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Abstract

The dairy sector contributes significantly to rural livelihoods, food security, and economic development in Bangladesh. Also, there is growing demand for milk in the domestic market. Parts of the population still encounter nutritional deficits while average milk yields are falling short of global standards. This gap highlights the need to enhance local dairy production through improved farm-level technical efficiency (TE). Addressing diverse agro-ecological and heterogeneous market conditions, this study investigates dairy farm performance, using data from 495 dairy farms collected in three different climatic zones and under consideration of traditional, cooperative and private markets. A Cobb-Douglas stochastic frontier was employed to estimate TE. Results indicate that efficiency is influenced by a combination of institutional factors, market dynamics and socio-economic conditions. Variations in milk production are largely explained by the number of lactating cows per farm and, in some cases, by land size. The mean TE is highest in the river zone, in comparison to the other two production zones. In contrast, distinguishing farms according to marketing channel did not yield substantial differences in TE. The within-household own milk consumption influences however seems to enhance TE, particularly on farms located within coastal and dry regions. Moreover, the distance from food markets is inversely correlated with TE. The relatively high TE among cooperative-linked farms was facilitated by the provision of training and extension services. In summary, the findings demonstrate that household education, consumption of own produced milk, household diverse income sources and experience in dairy production, serve as significant factors in driving the TE of dairy farms in Bangladesh. Although food safety practices may empirically correlate with lower TE in the present analysis, they remain essential for long-term farm sustainability and consumer health. These findings highlight the need for region- and market-specific strategies with a focus on training and extension services, infrastructure development and resource optimisation to enhance farm efficiency in the Bangladeshi dairy sector.

Keywords: Bangladesh, dairy farm, market channels, production zones, technical efficiency