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**Improving Quality in Agricultural Supply Chain through Financing  
the Smallholder Farmers in Emerging Economies**

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# Improving Quality in Agricultural Supply Chain through Financing the Smallholder Farmers in Emerging Economies

## *Abstract*

The quality of agricultural products plays a vital role in improving the profitability and income of farmers. However, capital-constrained smallholder farmers in emerging economies face difficulties in producing high-quality products. The availability of traditional *bank credit finance* (BCF) is limited owing to the lack of creditworthiness and collaterals. The farmers located away from urban areas often fail to get access to customers who can afford high-quality products. Motivated by the recent developments of the online platform, such as Amazon India, in the agricultural supply chain, we explore the feasibility of smallholder farmers selling through it. The online platform provides *platform credit finance* (PCF) to the farmers and offers a better wholesale price to attract them. In addition to the farmers' *quality improvement* effort, the online platform must impart a *quality preservation* effort to maintain the harvest quality while delivering at customers' doorstep. We observe that a higher *price premium* enjoyed by the online platform for doorstep delivery is essential for its operation. Using a non-cooperative game-theoretic model, we compare the effort decisions of farmers and the online platform, and farmers' choice of selling location – local market (L) or online platform (P). Based on the credit availability (BCF or PCF) and selling location (L or P), we identify three feasible strategies: BCF-L, BCF-P and PCF. We recommend that the online platform operates as a reseller (BCF-P) when the bank loan is available and affordable for the farmers. However, the platform ceases to operate when the *price premium* is low; hence, the farmers sell in the local market (BCF-L). The online platform, with small quality-preservation costs, should finance the farmers (PCF) when the bank loans become either costly or unavailable. We also observe that opportunistic behavior is detrimental to the platform's operation.

**Keywords:** Quality Improvement, Joint Effort, Bank Financing, Platform Financing, Agriculture Supply Chain.