Returns to investment in postharvest loss reduction technologies among mango farmers in Embu County, Kenya

ABSTRACT

Horticultural production is a source of livelihood for many smallholder farmers in Kenya. However, the potential is hampered by high postharvest losses estimated at 40%–50% in fruit and vegetables. The losses are attributed to various factors including postharvest handling, lack of storage technologies, lack of processing facilities, and poor market access. Consequently, some farmer groups have resorted to aggregation of their mangoes and engagement in small scale processing of mangoes into shelf stable products that cannot be marketed widely. In order to bridge the lack of capacity of smallholder farmers, the University of Nairobi's postharvest project with support from the Rockefeller Foundation's YieldWise Initiative seeks to upgrade two fruit aggregation centers by creating awareness and providing existing, applicable, and proven postharvest loss reduction technologies such as tunnel solar driers, brick coolers, charcoal, and CoolbotTM cold storage technologies. However, the potential economic impact of the proposed investment is not known. Hence, this study aimed at assessing the potential economic returns to investment in postharvest loss reduction technologies among smallholder mango farmers in Embu County of Kenya. A critical overview on methods employed in analyzing returns to investment in agricultural technologies has been provided. The economic surplus model was used to estimate the potential benefits of the investment. Using the cost–benefit analysis (CBA) approach, a maximum adoption rate of 10% over 10 years, and a 10% discount rate, it was found that the investment was worthwhile. The NPV was US $ 1.3 billion. The IRR and BCR were 28% and 4.29, respectively. Sensitivity analyses showed that the investment is viable at higher adoption and lower discount rates indicating the need to promote the technologies even under more difficult macroeconomic conditions.