

Technology Adoption, Value Chain Analysis, and Market Participation in the Beekeeping Industry of Assam, India

ABSTRACT

The rural non-farm sector is considered one of the most critical sectors for agricultural diversification, addressing the challenges faced in smallholder agriculture through enhanced income opportunities. In this context, beekeeping presents a promising pathway to enhance these rural livelihoods and ensure greater stability in smallholder incomes. However, critical gaps remain in the literature, including limited technological and market access, as well as fragmented value chain integration. Assam, a North Eastern state in India, characterized by its rich biodiversity and favorable agro-climatic conditions, possesses significant potential for the advancement of scientific and profitable beekeeping. Despite this potential, the sector remains largely small-scale, informal, and under-commercialized, with wide variations in technology adoption, value addition, and market participation. This thesis addresses these gaps through four objectives: i) examine the determinants affecting the decision of expansion and its extent; ii) identify and analyze the determinants affecting the adoption of technology; iii) map the beekeeping value chain along with upgrading strategies and assess the value created along with its interconnectedness; and iv) investigate the determinants influencing the market participation decision and its intensity. The study is based on primary data collected from 350 beekeepers across three districts of Assam. The determinants of expansion and market participation were explored using Cragg's Double Hurdle Model. Determinants of technology adoption were identified using logistic regression. The value creation and interconnectedness between the different chain actors were achieved by integrating the value chain and value network approaches. The findings reveal a lack of technological access, inadequate institutional support, weak collective marketing mechanisms, and fragmented integration of smallholders. Policymakers should therefore undertake initiatives to scale up the dissemination of technical knowledge, market linkages, and value-added activities, thereby strengthening smallholder livelihoods and promoting rural development.

Keywords: Beekeeping; Expansion; Technology Adoption; Value Chain and Networks; Market Participation; Assam