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Innovation and Transition in Agriculture: How dairy farming is emerging in the coffee agroforestry systems of Kenya

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Emerging challenges to farming drives farming systems to have three strategies; intensification options optimizing resources and technological innovations, firm diversification orchestrating interdependencies among sectoral boundaries, and transition to new system and trajectories. The intensification in the coffee system is the process to specialize in coffee using new varieties and practices while the second option is diversification to complementary enterprises to adapt challenges. The trajectory shift emphasis on how new sectoral systems (dairy sector) emerges, and its link with the previous system (coffee) in terms of impact pathway. In the multi-level perspective however, there is no simple cause effect relationship drives transitions rather systems change is enacted by various types of actors. This paper, therefore, presents (1) how the transition from coffee to dairy based farming system is taking place? (2) How the different actors in the innovation system of transition contribute to the learning and innovation process? (3) What contributes the transition from intensified coffee based to dairy based farming system on household food security? Our data collection consists of household survey (120) for household specific data, focus group discussions (9 FGDs) and stakeholders' interview. The results revealed, coffee production declined by 65% in the last 30 years, and the trend is straight. The dairy on contrary is in opposite visualizing sharp increase in volume of production and price. In line to this, innovation process and actors' interaction to adapt to climate change differs for the coffee and dairy. Actors in the coffee are limited, the system is highly centralized with limited options to farmers to process and market their product while the dairy sector is informally controlled by demand based business, comparatively numerous actors with limited government intervention, various options to marketing. The strong correlation between farm performance and socio-institutional variables, stakeholder interaction suggests the need for the establishment and strengthening of local institutions that have capacity to break the farmers' capital constraint to invest in climate smart agriculture which is beneficial to sustain systems.

Keywords: Climate Change, Coffee agroforestry, Climate Smart Agriculture, Innovation, Transition.

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