The use of digital technologies for agriculture and food security in Mali: barriers and enablers

Amadou Sidibé and Laura Schmitt Olabisi
IPR-IFRA Katibougou, Mali; Michigan State University, USA
Corresponding author email: sidibe.amadouy@gmail.com

Background

The study is inspired by the recognition of the importance of investigating the new area of digital technologies in developing countries in order to contribute to better development outcomes. Most evaluation studies of agriculture technology place emphasis on the economic aspects of productivity, profitability and technical efficiency of the technology and the implication on users' livelihood. However, several studies approach technological innovation as a socio-technical phenomenon whereby the interaction between technology and users is not mediated only by end-oriented activities of designers but also by sociocultural conditions of users. They emphasize that understanding the underlying processes that may enable or constrain the take-off and the outreach of technology is critical for future intake by local communities (Richard, 2010; Jessen and Vellema, 2011; Berhout and Glover, 2011).
The purpose of the study is to contribute to understanding these processes and providing insights to the stakeholders for necessary adjustments of technological innovation in the conditions of developing countries.


Sanji, Senekela


Sentinel-2 Agri.


STARS

Objectives

The study aims at contributing to improved use of digital technologies for agricultural development and food security in developing countries by answering to the following questions:

1. What technology is appropriate in the African context?
2. What it is about the socioeconomic conditions that may enable or constrain the use of digital technologies?
3. What institutional conditions may enable or constrain the take-off of digital technologies for agriculture and food security in developing countries?

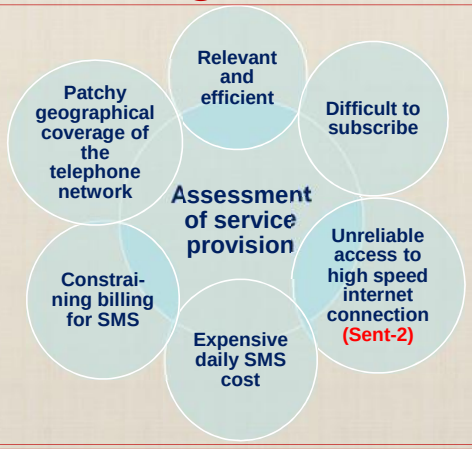
Methodology

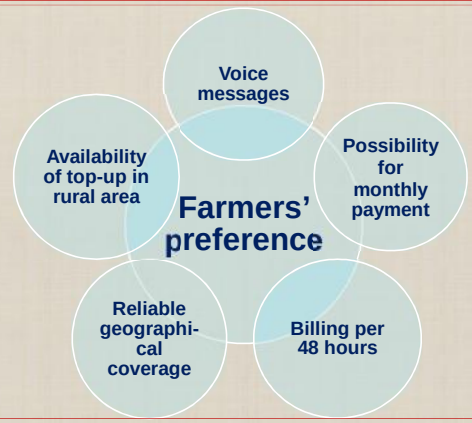
What is it about digital technologies that may enable or constrain their being used in developing countries?

System dynamic modeling (Amelia, Kopainsky et al. 2014) to explore the future of digital technologies under different conditions

Realist Evaluation (Pawson and Tilley. 1997) to assess the present of the digital technologies and to understand the Context-Mechanism-Outcome-Configuration (CMOC)

Major findings





Conclusions

The preliminary findings suggest that the process of technology evaluation requires different levels. In addition to the evaluation of the relevance, the profitability and the technical efficiency of the technology, there is need to evaluate not only the conditions for users access to and use of technologies but also the governance (information flow and feedback loops among stakeholders) and the adoption of the technologies under different future scenarios.
The effect of technologies on farmers decisions depends on the way the technology design takes into consideration the decision spheres in the household whereby the age issue is an important driver. Young people are more immersed into technologies therefore have more new information whereas key decisions are made by elder people. Moreover, the outreach and sustainability of digital technologies have to do with how the used technologies accommodate the illiteracy and it's implications on the way new information are channeled to farmers.

Bibliography

1.Amelia, D. F., B. Kopainsky and P. H. Nyanga. (2014). Exploratory model of conservation agriculture adoption and diffusion in Zambia: A dynamic perspective. 32nd International Conference of the System Dynamics Society. Delft, Netherlands.
2.Berkhout, E. and Glover, D. (2011).The Evolution of the System of Rice Intensification as a Sociotechnical Phenomenon: A report to the Bill & Melinda Gates Foundation, Wageningen, NL: Wageningen University and Research Centre.
3.Doss, C. R. (2006). Analyzing technology adoption using microstudies: limitations, challenges, and opportunities for improvement. Agricultural Economics, 34(3), 207-219.
4.Jansen, K., Vellema, S. (2011). NJAS - Wageningen Journal of Life Sciences 57, 169–177
5.Pawson, R. and Tilley, N. (1997). Realistic Evaluation. London: Sage.
6.Richards, P. (2010). Ritual dynamics in humanitarian assistance, Disasters 34, S138-S146