Chapter 5

The Development of e–Agriculture in Sub–Saharan Africa:
Key Considerations, Challenges, and Policy Implications

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ABSTRACT

The rapid growth of Information and Communication Technologies (ICT) has led to new opportunities to improve food and agricultural production, processing, distribution, and marketing functions in Sub-Saharan Africa (SSA). Such ICT-led transformations are expected to provide vast social and economic benefits to poor agricultural communities thus help uplift their standards of living. The process of how ICT should be applied in agriculture to raise living standards of millions of poor Africans is not yet well understood. Therefore, there is a need to deepen our understanding of ICT deployment and the socio-economic benefits expected from their application in African agriculture. Historically, some technologies failed in Africa and parts of Asia because of inadequate attention to context specific issues, irrelevance, and relatively prohibitive costs. In that regard, this chapter describes a framework for sustainable e-agriculture development in SSA. The proposed framework is based on three related models; (i) e-agriculture service delivery (ii) ICT development and diffusion pathways, and (iii) e-information flow and e-content development landscape. In order to facilitate the effective diffusion and adoption of e-agriculture, a set of “preconditions” and “e-value creation” opportunities are assessed. The identified preconditions help to filter out “irrelevant” ICT, and “e-value creation” facilitates use of context specific and demand-driven e-innovations in agriculture. The chapter identifies and discusses ICT illiteracy, ICT policy gaps, infrastructural deficiencies, and poverty as key challenges affecting the future success of e-agriculture in SSA. The chapter recommends the development of e-policies and e-strategies on e-content, e-trust, e-security, and e-value addition to promote sustainable e-agriculture development on the African continent.

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INTRODUCTION

The rapid diffusion and adoption of information and communication technologies (ICT) around the world has led to a growing desire to understand clearly how these modern technologies should be applied in key economic sectors in a developing country context. There is a growing realization that ICT are essential for accelerating socio-economic development and the modernization of agriculture in Sub-Saharan Africa (SSA) in the 21st century. The use of ICT to promote agricultural development in SSA offers tremendous socio-economic benefits and new opportunities to transform the livelihoods of poor agricultural communities and society in general. Some of the expected benefits from ICT are food security arising from productivity gains in crop and livestock enterprises, better access to national and global agricultural markets, improvements in rural financial service delivery, reduction in transaction costs, faster communication methods, e-health services for farmers, and the provision of accurate, reliable, and timely information for farm household decision making. The use of ICT in agriculture and rural development (i.e., e-agriculture) will make a significant contribution towards reducing poverty and malnutrition on the continent (Bertolini, 2003). Therefore, the diffusion and adoption of ICT offers a renewed promise to improve SSA’s prospects to achieve the Millennium Development Goals (MDGs).

The benefits of ICT applications in the financial (e.g. e-banking, m-banking, etc.) and education sectors (e.g. online learning, distance education, NEPAD e-school initiative etc.) are relatively well known. What remain unclear are the potential benefits of ICT use in agriculture and rural development in SSA. Although ICT use in the agricultural sectors of most developed nations started more than a decade ago (e.g. precision farming, e-auctions, computerized record keeping, online input procurement services offered by dealerships etc.), it has been lagging behind in developing countries. The past five years has seen a surge in interest to explore potential opportunities offered by ICT to smallholder farmers, agribusinesses, emerging rural entrepreneurs, governments, and non-governmental organizations (NGOs) in developing countries. In that regard, this chapter describes a framework for e-agriculture development in SSA. The chapter proposes three main inter-related frameworks; (i) an e-agriculture service delivery model, (ii) ICT development and diffusion pathway model, and (iii) an e-agriculture information flow and e-content development landscape. The development and implementation of these frameworks requires certain preconditions and e-value strategies to enhance the sustainability of e-agriculture.

In the past, the world experienced the euphoria associated with new technologies that did not live up to their initial high expectations. Today, ICT stand at a similar crossroad where societal expectations of the socio-economic benefits may be higher than what is practically possible. Some green revolution technologies failed in Africa and parts of Asia because of failure to articulate context specific issues, irrelevance, and prohibitive costs (Atkins and Bowler, 2001). The challenge therefore, is to design innovative strategies that enable the development of e-agriculture in order to avoid some of the common technological pitfalls of the 20th century which now provide important lessons for e-agriculture. In that respect, establishing certain preconditions for ICT use in agriculture, delineation of e-services, development of affordable technological platforms or diffusion pathways, and identification of tangible benefits are necessary but not sufficient conditions for successful e-agriculture development in SSA. In addition to that, there is need to aggressively promote e-value creation in e-agriculture service delivery across the agricultural value chain. Ultimately, the major driving force behind long-run demand for e-agriculture services will be end user...