Chapter 15
System Design and ICT Adoption in Agricultural Extension Services Delivery in Tanzania

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ABSTRACT
The major purpose of this chapter is to explore the options of Information and Communication Technologies (ICTs) to complement conventional agricultural extension services in Tanzania. Group discussions and meetings were conducted to investigate the role of ICTs in extension services delivery using CATWOE framework of Soft Systems Methodology. The findings of the study reveal that the use of SSM helped the researchers to understand easily the problematic areas of the current situation of agricultural extension services. In addition, it was easy to plan feasible actions to be taken to improve the situation. The framework for the conceptual model towards improving the agricultural extension services in Kilosa District of Tanzania was developed. These results have been used in the development of an ICT-based system (Web- and Mobile-Based Farmers’ Advisory Information Systems) to supplement the conventional agricultural extension system. The roadmap developed as the implementation plan for this research can be used in any e-Government project. The need to improve the way agricultural extension is done in Tanzania through integration of relevant and affordable ICTs is well researched. This book chapter presents how this can be done using SSM approach in an action and participatory research. This is the first presentation of SSM intervention in agricultural informatics in Tanzania. The approach used in this study can be adopted by researchers doing any e-Government research.

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BACKGROUND

Agriculture employs 80% and has significant contribution to the economy of Tanzania. The study by Sicilima (2003) shows it contributes 50% of the GDP but of recently, contribution of agriculture to GDP is less than 50%. The sector accounts for 30% of GDP, 30% of export earnings and 65% of raw materials for domestic industries (URT, 2008).

The crops cultivated range from those produced for food and for cash purposes. Examples of food crops are maize, sorghum while cotton and cashew nuts are cash crops. Even though there are large scale farmers, smallholder farmers are main producers of food crops (Scialabba, 2000).

Thus, the Government of Tanzania has established various policies and different programs to sustain smallholder farming. Examples of such initiatives are Kilimo Kwanza, Famogata, MKUKUTA, subsidized farm inputs Program, Southern Block Agriculture Development, MKUZA, TASAF etc (MAFSC, 2009). Despite all these initiatives and immense potential for agriculture productivity, agricultural growth rate in Tanzania is not encouraging. According to Eele et al. (2000) the growth rate of agricultural in Tanzania is 4%. Thus, its contribution to food security, poverty reduction and agricultural production and productivity is very minimal.

Factors hindering the growth of agricultural sector are: low farm produce price, inadequate agro-processing, weak cooperative system and limited access of farmers to information pertaining to agricultural innovations and agricultural technologies (Kaaya, 1999; Eele et al., 2000).

Agricultural innovations and agricultural technologies are mainly produced from agricultural research institutes (Sanga et al., 2007). Agricultural researchers in Tanzania have developed a number of agricultural technologies and innovations, but very few smallholders’ farmers are aware of such developments. Hence, there is a need for looking into how the usage of most agricultural innovations and technologies to farmers can be improved. In principle, agricultural extension officers are used as educational tools in disseminating agricultural technologies and innovations to farmers; but in many countries including Tanzania, they face a number of obstacles. Some of the factors affecting extension services in Tanzania are inadequate extension officers, inadequate working facilities, poor incentives for staff retention and weak link between research-extension and farmers (Sicilima, 2003).

Various studies have shown that traditional way of disseminating agricultural knowledge and information in Tanzania have had limitations in reaching out to many farmers, a situation which prompts to seek for complementary alternatives (Parikh et al., 2007). Thus, this calls for a research to investigate how ICT can strengthen the weak link between researchers, extension officers and farmers. The key question raised during the workshop was: How can an extension service supported by ICT be designed?

More specifically, workshop participants were interested in understanding how the ICTs will link researchers, farmers and other actors in the agricultural value chain. The role of researchers in the value chain is to disseminated knowledge to farmers via extension officers. Hence, researchers must complement the knowledge of agricultural officers and the indigenous knowledge owned by farmers. Given that the study’s focus was new ICT options to support extension, existing approaches were deemed insufficient (Sicilima, 2003). Thus, the researchers were required to develop new approaches that would provide enhanced agricultural extension services from alternative viewpoints.

This chapter tries to answer the research question “How can an extension service supported by ICT be designed?” The chapter addresses this question by investigating the ICT led- extension services in Tanzania. The chapter further introduces Soft System Methodology (SSM) concepts and articulates how they are used in analyzing the potential of ICTs in unlocking the fuzzy problems facing the conventional agricultural extension