

Research Application Summary

The role of Information and Communication Technology in enhancing university-smallholder farming community engagement

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Abstract

In the modern information economy, communication and information sharing is key in improving one's way of working, thinking and living. Studies indicate that despite the flourishing Information Communication Technology (ICT) sector and a vibrant higher education sector, rural smallholder farmers are still struggling to access vital knowledge and information to improve their farming practices, access to market and policy advocacy. Higher institutions of learning through their outreach programmes have an important role to play in enhancing smallholder farmer's ability to timely access knowledge and information. However, reorientation will be required for these institutions to deliver. This calls for innovations requiring approaches, frameworks, and models that exploit the potential of ICT's in empowering higher institutions of learning capacity and ability to fill the knowledge and information gap among smallholder farmers. This paper discusses the role of innovative ICT's in enhancing university smallholder farming community engagement.

Key words: Higher education, knowledge and information, smallholder farmers

Résumé

Dans l'économie moderne de l'information, la communication et le partage de l'information sont essentiels pour améliorer les méthodes de travailler, de penser et de vivre. Des études indiquent que, malgré le secteur florissant des technologies de l'information et de la communication (TIC) et un secteur dynamique de l'enseignement supérieur, les petits agriculteurs ruraux continuent de lutter pour accéder aux connaissances et informations vitales pour améliorer leurs pratiques agricoles, leur accès au marché et la défense des politiques. Les institutions supérieures d'enseignement grâce à leurs programmes de sensibilisation, ont un rôle important à jouer dans l'amélioration de la capacité des petits agriculteurs à accéder rapidement aux connaissances et à l'information. Cependant, une réorientation sera nécessaire pour que ces institutions puissent délivrer efficacement l'information. Cela fait appel à des innovations nécessitant des approches, des cadres de travail, et des modèles qui exploitent le potentiel des TIC dans l'amélioration des institutions supérieures des capacités d'apprentissage et de combler le gap de connaissances et d'informations entre les petits agriculteurs. Cet article traite du rôle des TIC dans l'amélioration de l'engagement des universités dans petites exploitations agricoles.

Mots clés: Enseignement supérieur, connaissances et informations, petits agriculteurs

Background

Smallholder farmers dominate the agricultural sector in developing countries. Majority of these smallholder farmers are women (Hazell, 2005; Munyua and Adera, 2009). In sub-Saharan Africa, smallholder farmers contribute up to 90% of the food consumed (Salami *et al.*, 2010) and 80% of the population rely on agriculture for their livelihood. In Uganda, agriculture is the main livelihood source to nearly 73% of the population (CABRI, 2013). Between 2001 and 2002, the growth of the agriculture sector in Uganda was at 7.7% but dropped to 0.1% between 2006 and 2007 (CABRI, 2013). Despite the importance of agriculture, growth in the sector remains surprisingly low. The Ministry of Finance, Planning and Economic Development (MFPED) noted large variance in growth in the agriculture and the manufacturing and services of 20% and between 8 and 13% respectively between 2000 and 2010 (MFPED, 2011). Bellon *et al.* (2002) and Giller *et al.* (2006) attributed slow growth of the agriculture sector to challenges smallholder farmers face that impact on their production. These challenges are attributed to several factors which include; inappropriateness of technologies, lack of access to input and output markets, and lack of supportive advisory services (knowledge and information) (Stringfellow *et al.*, 1997).

According to Mirembe *et al.* (2016), universities core components of the national agricultural information system (NAIS) should improve outreach programmes to smallholder farmers as a means to bridge the advisory service gap. In this regard, universities have a large pool of undergraduate, postgraduate and teaching staff that have a large impact on farming communities. However, the current university outreach models of demonstration farms, farmer field days, student field attachment and scholarly publications are not responsive to farmer's needs (Ebanyat *et al.*, 2010). Rather evidence indicates that university information and other knowledge remains used by clients. The development of ICT mechanisms to facilitate demand assesment, priority setting and timely sharing of quality information and knowledge to smallholder farmers remains critical. Grimshaw *et al.* (2011) indicated that appropriate application of ICT tools and agricultural knowledge products has potential to increase access to information and knowledge, resulting into increased uptake of agricultural technologies by smallholder farmers. In the long run there would be improved productivity, access to financial services, access to markets and product innovations and overall improved livelihood of smallholder farmers (Okello *et al.*, 2011).

Foundation of this Research study

This research builds on the experiences of the Community Action Research Project (CARP) entitled Strengthening university-farming community engagement for improving livelihood (SUFACE). Lessons from the SUFACE project indicate that 70% of the farmers are women and are often constrained in terms of accessing usable information on weather forecast, farmer management, pest and diseases control, seeds and farm input, market and prices, among others. It was noted that there are many initiatives to

enhance smallholder farmer access to critical information, but most of the efforts are not sustainable as efforts are supply driven as opposed to demand driven. The inappropriateness of intervention are in part due to lack of understanding of smallholder farmer information needs, value and preferred mode of information access. Working with two community-based organizations (WOUGNET and PKWI), this research is championing the use of multimedia content and a farmer tracking system to enhance university smallholder farmer engagement.

Conceptual Framework

The project conceptual framework is premised on the understanding that uptake of agricultural technologies depends on timely access to reliable and quality information and knowledge (Figure 1). This study contributes towards addressing the limited access to agricultural information and knowledge by smallholder farmers.

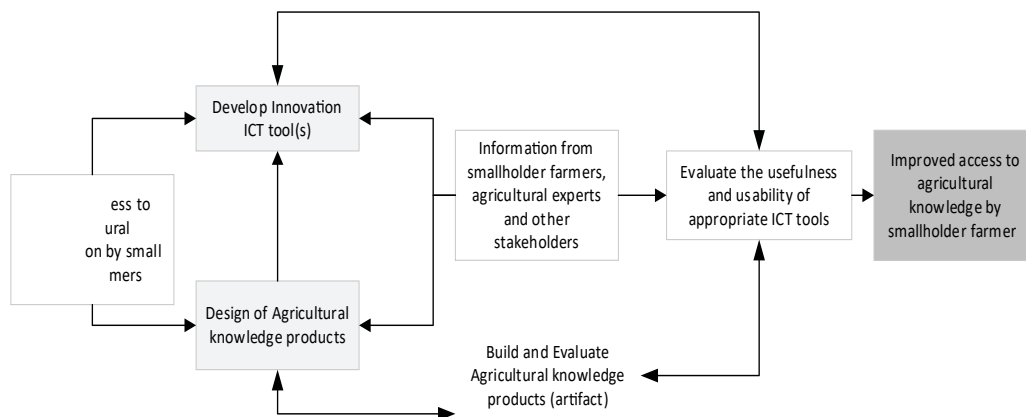


Figure 1: The Conceptual Framework

As a way of improving smallholder farmers' access to agricultural information, we created a knowledge sharing environment where agricultural experts with versed knowledge and experience exchange/share knowledge with smallholder farmers using mobile phones. In the course of this research, artifacts are built and evaluated. Through development of a mobile application together with information and knowledge products, improvement in access to agriculture information and knowledge products is expected.

Research Approach

In this research, we use two methodologies (participatory action research methodology and agile development methodology). Agile development methodology is a domain methodology used during software development (Highsmith and Cockburn, 2001). We tailor these two methodologies to fit our way of working.

Participatory action research is a means to address the gap between researchers and intended beneficiaries of the research (McTaggart, 1991). The approach is cyclical with

four inter-related stages (plan, act, observe, and reflect). Adopting this methodology enables researchers identify the various issues that need to be addressed by the innovations, identify system requirements, farm produce information, crop variations etc. For system flexibility, different participants are involved at each stage of system development. This allows a sizable sample number of persons' opinions taking part in the system requirements gathering.

Diagnosing the problem and action planning, we examine interactions and relationships in social settings through collaborative work-group sessions and exploratory surveys. This is to enable researchers identify opportunities for improvement; study and understand the background information on farm communities; describe the research orientation and its rationale; and understand issues encountered by farmers in resource constrained settings. In this phase, students, researchers and other stakeholders work together in a collaborative manner to propose new courses of action that help farmers improve their work practices. The obtained information is stored in a central knowledge base repository. The information/data in the central knowledge base repository is shared through various communication mechanisms e.g. websites, publications, electronic meetings, mobile collaborative learning application etc.

The focus of action research are the actions taken, the resulting change, and the transformation thinking, acting and feeling by the persons ratifying the change. In phase two (action taking) therefore, researchers seek evidence from multiple sources, i.e., through field studies and comparative studies to help them analyze reactions to the action taken. This phase, is an iterative, cyclical process of reflecting on practice, taking action, reflecting, and taking further action.

Agile development methodology allows iterative development of system modules. These modules are based on the defined set of requirements from action taking. Modules are integrated when ascertained that user requirements have been met, otherwise, new requirements are identified and the cycle repeated. Evaluation and learning outcomes occur in phase two where feedback from stakeholders is processed and used to update the information in the central knowledge base repository.

Conclusion

This research builds on the experiences of the SUFACE project that closed in 2015. The study is examining effectiveness of smart mobile phones in the dissemination of agricultural knowledge products and market information for small holder farmers and how Mobile phones can be used to enhance agricultural knowledge sharing among smallholder farmers in Northern Uganda.

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