

Strengthening Extension and Advisory Services Delivery through Village Knowledge Centre in Rungwe District, Tanzania: Lessons Learned from InnovAfrica Project

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ABSTRACT

Albeit its critical role in the development of the agriculture sector, the delivery of Extension and Advisory Services (EASs) in Tanzania has remained unsatisfactory and has had a limited impact on the sector. Among others, conventional approaches used in providing EASs have been found inadequate in meeting the priority needs of their clientele. Besides, they tend to demand many frontline extension agents who are few and are unable to serve farmers effectively. Thus, most recently, Information Communication Technologies (ICTs) have the potential to overcome many of the challenges associated with the conventional provision of EASs. As a result, various innovative ICT-based approaches have been blended with conventional EASs to improve the service to clients. These include the use of community radio stations, TV programs, telecentres, Mobile Phones (SMS), and web-based and mobile-based farmers' advisory information systems. This study draws on the work of the ICT-based Village Knowledge Centre (VKC) established in the Rungwe District in Mbeya Region. We explore the experiences of various stakeholders in using the VKC in the delivery of extension services. Challenges hindering the functioning of VKC are highlighted and recommendations to improve the functioning of VKC and consequently, the delivery of EASs are drawn.

Keywords: *Village Knowledge Centre; ICTs; EASs; agricultural extension services; Tanzania; agricultural information; information-seeking behaviour.*

INTRODUCTION

Information Communication Technologies (ICT) has made it possible for members of underprivileged communities to get their share of information and critical knowledge through the Internet and internet-laden devices (Kimaro 2006; Mtega & Malekani 2009; Kiiza & Pederson 2012; Nyamawe & Seif 2014; Mittal & Mehar 2016; Gogoi & Saikia 2020), and this has largely been achieved through the establishment of telecentres across rural or peri-urban areas (Rogers & Shukla, 2001; Senthilkumaran & Arunachalam, 2002; Gogoi & Saikia, 2020). As a result, telecentres are found in various parts of the world and are expected to spearhead change and development in general. Similarly, the advancement of ICTs has had an impact on Extension and Advisory Services (EASs) as there has been a tremendous shift from conventional EASs to blended ICT-enabled services. The turn to blended ICT-enabled EASs has been particularly noticeable in developing countries where about 800 million people earn their primary livelihood from small farms (World Bank, 2017). This is quite evident following the adoption of ICTs in EASs delivery (Sanga et al., 2013a, 2014; Mtega & Msungu, 2013; Stoll, 2015; FAO, 2017, Lwoga & Chigona, 2018, CTA, 2019).

Public access to ICT facilities comes in a variety of models. Computer labs in public libraries, Internet cafes and telecasters are a few examples of these facilities. All these concepts and methods share many similarities and work toward closing the digital divide and promoting socioeconomic advancement. Regarding ICT access in Tanzania, the literature shows that public libraries have a broader range of resources compared to the few available telecasters in rural areas, and their focus on the community offers them a competitive advantage. Unlike rural areas, Internet cafes and other web-based ICT facilities are increasingly prevalent in urban areas. Therefore, telecentres are frequently the only locations in rural areas where people may receive ICT services. They range from simple ICT-equipped rooms to multi-functional information hubs that double as public libraries.

The Village Knowledge Centre (VKC) was established in the Rungwe District of Tanzania by the InnovAfrica project¹ to provide information services and support government efforts to improve the delivery of EASs through the adoption of ICTs (Haug et al., 2021a, Haug et al., 2021b). The importance of agricultural extension in agricultural and rural development is well acknowledged in a country where most of the population depends on agriculture as their main source of livelihood. Moreover, the importance of extension services is echoed in policy documents including the National Agriculture Policy - NAP (URT, 2013). Thus, in part, NAP states that:

“Extension services are crucial in supporting poverty reduction in rural areas and market competitiveness for commercial agriculture in the domestic and global markets. It enables producers to realize increased production and productivity through access to information for marketing and other support services essential for agricultural development” (p. 14).

Also, the Agricultural Sector Development Programme (ASDP II) acknowledges the importance of agricultural extension services in the transformation of the Tanzanian agricultural sector (Wineman et al., 2020). EASs provide the farmers with the knowledge, information, experiences and technologies needed to increase and sustain productivity, and for improved well-being and livelihoods (URT, 2013). Over the years, various approaches to EASs have been adopted, adapted, promoted and implemented in the country (Wambura et al., 2015b) for the improvement of service delivery and ultimately agricultural productivity. However, despite institutional reforms of EASs, the services are largely dominated by the public in terms of financing and delivery (URT, 2013). As such, EASs are provided by Government staff (ward extension officers– WEO) who are mostly stationed at the Ward level with a mandate of serving farmers in several villages, which varies from one district to another. As a result, extension-farmer contacts through conventional methods become very limited. The need to avert this shortcoming informed the establishment of the VKC to support the EASs for enhanced extension services.

The VKC, which is stationed at the District Resource Centre (DRC) in Ilenge Village, is a physical station equipped with basic facilities of ICTs including a laptop, two desktop computers, a printer, a photocopy machine, two web cameras, two, Uninterruptible Power Supply units, connected Wi-Fi routers and cables, creative radio and associated equipment, digital voice recorder, external hard drive, and a modem for Internet connectivity. Other resources are two wooden tables, fifteen office chairs, a noticeboard, and a wooden shelf where a variety of reading materials including books, booklets, posters and brochures are kept. It also has an office for the supervisor, a store and a plot of land for demonstrations and experiments on agricultural technologies. Besides the facility, an essential component of the VKC is its ICT which requires private ownership of a mobile phone for ensuring effective communication with farmers and among themselves.

¹ Innovations in Technology, Institutional and Extension Approaches towards Sustainable Agriculture and enhanced Food and Nutritional Security in Africa- <https://cordis.europa.eu/project/id/727201/results>

Two knowledge workers are responsible for offering services to the public under the supervision of the VKC Management Committee (VKCMC) and supported by a ward-based extension officer (WEO). These services cover training and awareness programs on various aspects including agriculture, animal husbandry, health, ICT, community development and other sectors depending on the context or information needs of the local people. It also provides an opportunity for farmers to access knowledge and information resources, and extension services, as well as digital platforms that can link these rural communities faster to information and knowledge sources. Given the emerging information society where agricultural production is shifting from resource-dependent to knowledge-oriented services, farmers in the Rungwe District have been visiting the VKC for information needs and extension services over the years.

A variety of services are provided at the VKC including basic training in ICT and computer applications for rural youth and women; facilitating access to information on markets, prices and government services; news, electronic libraries (e.g., SNAL- Mkulima Library <http://197.250.34.42/>) and publications on appropriate technologies and other social services.

The VKC also avail various reading materials and resources for visitors; provides access to a telephone, voice mail, emails and SMS and establishes and maintains a VKC members' WhatsApp group which serves as a communication platform. In addition, the VKC links farmers with extension workers, researchers and other sources of information such as radio and TV. Furthermore, there are mobile-based agriculture advisory services that are promoted (e.g., M-Kilimo-<http://exts.kilimo.go.tz/> and 'Mkulima Mbunifu'- <https://mkulimambunifu.org/>). These can be accessed at the VKC. The location of the VKC at the DRC enables farmers to visit demonstrations on crops and livestock technologies (e.g., Brachiaria, vegetable production and fruit tree grafting), which are supervised by the resident WEO. The visits to the demos are either done by individual farmers or in groups of farmers through training done at DRC or during field days. To be sure that farmers are making the most use of, and getting the best from the centre, this study sets out to assess the potential and challenges of the VKC to the required EASs) by the farmers.

THEORETICAL AND CONCEPTUAL UNDERSTANDING OF ACCEPTANCE AND USE OF INNOVATIONS

Village Knowledge Centers (VKCs) are part of arrangements under the generic term telecentres that seek to provide shared and mediated access to information and supply certain business services by using new emerging technologies, especially computers and the Internet or physical infrastructure in ICTs. A telecentre may consist of a small room equipped with one or more computers and a long-distance telephone or wireless telephone managed by one or more operators and charge a small fee per hour of use for the computer/Internet, fax, or long-distance telephone (Rogers and Shukla, 2001; Murkeji, 2008). Their mandate involves economic development, administrative reforms and social and cultural development (such as education, health, and gender).

The key element of the telecentres is the provision of access to information to its users, which is expected to trigger behavioural changes in their everyday lives. Thus, it has been argued that information has no inherent value, but it only has when it becomes accessible and usable (Wulystan & Andrew (2013). According to the diffusion of innovation (DOI), theory, acceptance or use and spread of innovation depend on the properties of innovation which include the user's perception of its relative advantages; to what extent it is compatible with the user's realities or circumstances, who adopt it and when, the accrued benefits and how visible they are, the easiness to use and the surrounding social system (Rogers 1995). In this case, VKC is taken to be an ICT innovation for enabling smallholder farmers to access agricultural information and knowledge. As such, it is important to understand "how people seek and make use of information, the channels they employ

to gain access to information, and the factors that inhibit or encourage information use" (Wilson 1997: 551).

The acceptance of use was evaluated by observing how individuals accessed information innovations or technologies communicated through the VKC (use pattern and efforts). However, for one to have the advantage of accessing such innovation, an intending user would have to make the effort either to visit the VKC or be linked to VKC through WhatsApp or any other means that could enhance access to information (perceived benefits). Krikelas (1983) was of the view that the individual recognizes an inadequacy in his/her knowledge which requires resolution to deal with a problem, thus leading the user on a search for information through various information sources. According to Krikelas (1983), information can be seen as any stimulus that reduces uncertainty. An information need is defined as the recognition of the existence of this uncertainty in the personal or work-related life of the individual. The effort to satisfy a perceived need results in information-seeking behaviour. This can be manifested by how individual farmers search for information in the specific context, content and sources and how information is converted into specific action through its adoption (Babu et al., 2012). Further to that, the measure of the extent to which accessed information is used is critical in determining the acceptance of the communication innovation. Based on the above, it is envisaged that it is possible to determine if the VKC can broaden its user base by reaching out to socially and economically disadvantaged communities.

METHODOLOGY

Research Settings and Design

The study was carried out in Rungwe district of the Mbeya region in the Southern Highlands of Tanzania. Rungwe District lies at an altitude ranging from 700 to 2,000 meters above sea level and receives annual bimodal rainfall between 900mm and 2700mm with temperatures ranging from 18°C to 25°C. It is densely populated and uniquely known for its rich experience in dairy cattle keeping using a zero-grazing system. The main crops produced include tea, coffee, banana, pyrethrum, maize, avocado and cocoa (URT, 2017). It is one of the two districts in Tanzania where the InnovAfrica project was implemented since June 2017 (www.innovafrica.org). The project aimed at improving food and nutrition security through innovative approaches. It focused on promoting several Sustainable Agricultural Intensification (SAI) innovations through farmer-led field experiments, scaled out through different Extension and Advisory Service (EAS) approaches and supported by Innovative Institutional Approaches (IIAs) like seed delivery systems. Under EAS innovations, two VKCs were established, one in Kenya and another in Tanzania (Ilinge Village, Rungwe District) mainly to test their extension potentials for disseminating technological innovations tested and promoted by the project. Drawing from a household survey as well as several follow-ups, Focus Group Discussions (FGDs) and key informant interviews (KIIs) and monitoring activities, this paper is based on the project processes and activities of establishment and testing of the Ilinge VKC.

Data collection processing and analysis

The study followed a case study approach (Creswell & Plano Clark, 2011). The aim was to get stakeholders' experiences in the processes of VKC establishment and audit usage efforts information accessed through the centre by different stakeholders in the Rungwe district. Then based on the findings construe the prospects and challenges of VKC in agricultural extension services. Data was collected using a mix of methods including KII and FGDs. FGDs were done with VKC users and continuous observation over two weeks and during field visits, and monitoring and evaluation missions were done with field notes and photographs recorded.

The KII was conducted with lead farmers, VKC workers, supervisor and management committee, government extension officers, Ilenge Village leaders, district officials and other strategic partners. FGDs and KIIs were done until it was clear that the perspectives were repeating, and data saturation had been achieved (Teddlie & Tashakkori 2009).

Qualitative data collection, processing and analysis went simultaneously. Analysis, founded on the context analysis technique, involved a series of steps: First, triangulation was done by reading and reflecting on the transcribed text to check for consistency of messages from the data set collected from a variety of stakeholders using different methods. Second, sentences and paragraphs were coded and labelled before grouping them into major themes. Third, a back-and-forth process of reading through the data set guided by the codes was done to identify patterns and relations. The themes were also reviewed by several research team members and examined to check for coherence and connection. Finally, a detailed description of each theme was done and the relationship among and between themes was discussed.

FINDINGS

Access to information before and after VKC establishment

Access to information before the establishment of VKC

It was observed or found that before the establishment of the VKC, agricultural information was accessed in groups from village and group leaders who got agricultural information from various sources including training by various stakeholders and extension officers. As such, group membership was the main way of accessing information from extension workers in the study area (Nchimbi-Msolla et al., 2018). The FGD participants noted the following:

R1: *“Before we mainly relied on our village and group leaders as sources of agricultural information. Any time they received new agricultural information they would call and share what they have learnt with us.”*

R2: *“...adding to what my colleague has said, it was not possible to get individual attention from our extension officers unless you are in a group.”* (FGD with Farmers, 15th May 2021).

Also, fellow farmers were another common source of information among farmers. This was mainly done through face-to-face- meetings or via mobile phone communication as illustrated below:

R3: *“If you get new information you visit your friends and share with them what you have learnt. If you cannot meet physically, you can share the information via mobile phone conversation with your fellow farmers. For example, when I got knowledge on avocado production, I shared that with my neighbours so that they too can improve their avocado production.”*

R4: *“... Or if you have new information on livestock keeping you may decide to visit him or use the phone to call him...”* (FGD with Farmers, 15th May 2021).

So, the farmer-to-farmer extension was important to bridge the gap as shown in the following extract.

“Because of the lack of extension workers, we opted to learn from each other. For example, if a fellow farmer has planted elephant grass around the farm and the grass is doing well, I will go and request two or three tillers and plant them around my farm too.”

“Another farmer will come to me and I will share the same way. So, each one who received knowledge shared with other farmers. This for us was the most progressive way of getting agricultural information.” (FGD with Farmers, 15th May 2021).

Besides, farmers obtained agricultural information and knowledge from extension workers. However, they acknowledged that there were very few extension workers, who were not able to cater for all their information needs through physical contact (Nchimbi-Msolla et. 2018, Haug et al., 2021a, Haug et al., 2021b). As a result, farmers contact extension workers for assistance through phone calls when faced with a serious problem.

Access to information after the establishment of the VKC

The study shows that farmers accessed agricultural information from the VKC and the WEO in addition to fellow farmers and other public extension workers. Thus, the establishment of the VKC and the ongoing experiments on *Brachiaria* technology at the DRC has enabled the farmers to learn about the technology for improving dairy cattle feeding. Also, through the VKC they get planting materials (seeds and tillers) to plant in their plots. As such, the VKC is a learning site as farmers got trained on the principles of *Brachiaria* production. Later they used their farms to apply the knowledge gained at the VKC. In turn, their farms served as a training site for other farmers as testified by the following remarks by a participant in the FGDs:

“My husband and I were trained here at the VKC on Brachiaria production. We were then given seeds which we planted at home. We were very meticulous and overelaborate in servicing our home Brachiaria plot. Neighbours were puzzled and attracted to what we were doing. When we started feeding our animals, we saw improvements in milk quality and quantity. So, neighbours came and started requesting tillers. Yes. We gave them and they planted them too.” (FGDs with Farmers, Rungwe, 15th May 2021)

Furthermore, FGD participants indicated that the VKC extension staff was a reliable source of information. Since the VKC extension officer was readily available at the centre, it was easy and convenient for farmers to contact him and seek advice on *Brachiaria* pasture production as well as access to planting materials. Also, during an interview, a respondent indicated that it was possible to request the extension officer to visit their fields and train them on how to grow and take care of the *Brachiaria* as indicated in the following interview extract.

“Honestly speaking when I saw Brachiaria experimental plot here at the centre I requested our VKC extension worker to help me plant the grass at home. He came and showed me how to plant” (KII, Farmer, Ilenge, 16th May 2021).

When asked if they perceived any difference before and after the establishment of the VKC during the FGDs, participants indicated that they used a relatively short time to access information at the centre as searching for information consumed a short time, and information accessed was relevant in their context and easy and simple to understand in a language they understand. This is because the presence of WEO specifically assigned to serve farmers at the centre helped them to have access to extension services.

“Yes, there is a difference in accessing agricultural information. Now we can come here to the centre, share our challenges with the extension worker and get a solution. At times he visits and advises us at home. For example, my Brachiaria was not growing well. The extension worker came and took soil samples and gave me feedback that I needed to fertilize the soil. I did it and it worked fine. Yes, it is very different now. We can also come and read agricultural materials here. It is different ...” (FGDs, Rungwe, 16th May 2021).

VKC use efforts and pattern of usage

Based on the data collected from September 2018 to October 2020 at the VKC, and from interviews with VKC workers it was evident that farmers' VKC visiting effort to access information was very low. The visitors were in the category of women farmers, primary and secondary school students, and researchers as revealed by a previous study by Mwantimwa & Ndege (2022), compared to the baseline indicator as stated previously. The following interview extract illustrates:

“There is still less usage of the centre by farmers and other users like school students (primary and secondary schools) and researchers” (Key informant interview with VKC worker Rungwe, 17th June 2021).

The finding reveals fewer physical visiting efforts, explained from the adoption theory perspective, at first, it is the innovators and early adopters who utilized an innovation (Rogers, 2003).

As shown in Figure 1, the most sought-after information was training, or education opportunities followed by Government-related information. Other information sought included crop/livestock production, information on employment opportunities, market and price information, and health-related information.

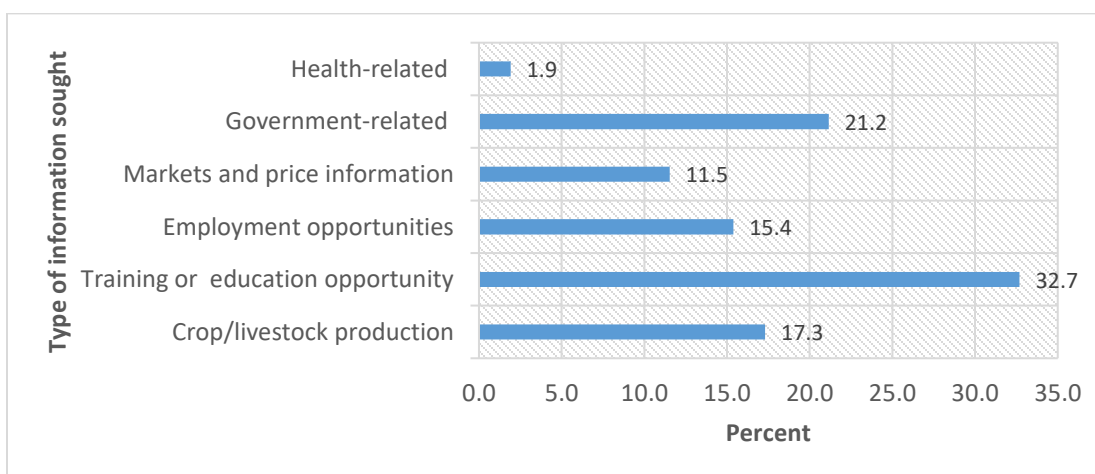


Figure 1: Type of information sought at the VKC (Source: monitoring report)

Perceived benefits of VKC

Access to training and information on Brachiaria as alternative fodder

In one of the FGDs, it was revealed that farmers perceived the VKC as a place that enabled men and women to access training opportunities on Brachiaria production technology and planting materials as an alternative source of dairy animal feeds. One of the participants commented:

“...my husband was one of the trainees at the VKC. After training, we were given seeds by the project. We planted and started watering and it grew very well. We then started sharing tillers with fellow farmers for them to plant and use” (FGD participant(Female), Rungwe, 16th June 2021).

Improved farmer-farmer and farmer-extension worker contact

Another benefit of the VKC, according to respondents, is that it provides an opportunity for the farmers to interact with extension workers for improving farming practices.

“In the beginning, we had limited interaction with our extension workers. Our contact with extension workers was limited. Thanks to the VKC we now have an extension officer at the centre who helps us improve our farming practices” (FGD participant(female), Rungwe, 16th May 2021).

Also, during one of the farmers' field days held at the VKC, participating farmers indicated that their involvement and participation in the VKC activities had boosted their confidence and enabled them to train their colleagues on the same.

“After comprehending what we did at the VKC, I created a group in Syukula village. I trained members, we establish a common plot and they are now taking tillers to plant it on their farms” (Farmer field day, Rungwe, 2nd October 2020).

Improved access to agricultural information and knowledge

Analysis of FGDs revealed at the VKC farmers had the opportunity to access information in different forms, that is, in print and electronic media on various agricultural technologies. Also, the VKC brought them together as a farming community. In this way, they benefited by having access to various agricultural information on new technologies and training as confirmed by comments from two of the female KII participants:

“We are proud of this centre. We learn various technologies from the materials available here at the VKC”. (KII participant, Rungwe, 16th May 2021)

“Here at the VKC we receive messages on meetings and various training programmes. When we came for the first time, we registered our phone numbers through which we continue getting useful information.” (KII participant, Rungwe, 16th May 2021)

VKC's potential for reaching many clients timely and at once

Results from discussions with VKC knowledge workers revealed that through the WhatsApp group, it was easy to contact many farmers at once and convey a message that required immediate action or response. This statement was substantiated by one of the VKC interview participants when he remarked:

“We send SMS to inform farmers when Bracharia seeds have arrived from SUA for collection and planting at the right time. In addition, the VKC WhatsApp group, emails and video conferencing facilities have enabled us to quickly contact experts at the district level and research institutions that we think have specific knowledge/information in specified areas to answer specific queries from livestock keepers we serve. This, in turn, helps in responding to their queries on time” (KII, Rungwe, 17th May 2021).

Opportunity for hosting study circles and TV/Radio watching /listening groups

Analysis of findings from an interview with the Village livestock extension officer revealed that the presence of the VKC has increased their effectiveness in disseminating agricultural information to their clients. The officer said:

“Since the VKC is located in the village, it is possible to organize farmers into study circles or TV /radio watching /listening groups for a specific topic of interest even during evening hours’ (KII- Livestock Extension officer, Ilenge Village 17th May 2021)

On the other hand, underscoring the importance of the presence of extension staff and extension service delivery for small-scale farmers during one of the field visits in Rungwe, one lead farmer said:

“You know here in Rungwe we have a community radio called Chai FM which is one of the channels used to disseminate agricultural information and knowledge. Nevertheless, some of the broadcasted information and knowledge is difficult for the farmers to understand easily thus needing some clarification from the extension agent” (KII, Male Lead farmer, Sogea Village 17th May 2021)

The implication is that the presence of the centre is an opportunity for farmers in groups to access agricultural information with their extension agent in a participatory way. This makes it possible for extension agents to clarify some of the issues not well understood by farmers instantly. Thus, making the information relevant to the target group.

Challenges

Challenges that hinder the effective functioning of VKC for EASs delivery are (i) less patronage of the centre by farmers (ii) VKC bills on the Internet, electricity and salary (iii) limited access to smartphone technologies by farmers and (iv) limited scope of VKC services.

Less patronage of the centre by farmers

This was indicated by the low visiting rate, analysis of monitoring and evaluation data collected for the period from September 2018 to June 2019, which indicated that on average four visitors accessed the VKC in a week. Compared to the envisaged frequency of 20-30 farmers per week during the design of the project, this visitor frequency was particularly low.

This could be in part due to limited awareness among farmers of the presence and services that the VKC offer. For example, when asked about his awareness of services provided by the VKC one participant said :

‘I am not aware of the services provided by the VKC (Farmer field day, Rungwe, 2nd October 2020).

The other reason is that farmers attach more value to physical inputs like seeds and fertilizer and less value to agricultural information. This is confirmed in the remarks by the resident WEO at a field day organized at Ilenge VKC:

“Our farmers in most cases view things like seeds, fertilizers and chemicals as important assistance they need in production, not information and knowledge” (Male extension officer, VKC supervisor)

As a result, since the VKC was yet to offer or link farmers with providers of other associated services mentioned earlier except Brachairia technical information and inputs (Brachiaria seed), they may yet have felt the need to visit the VKC.

Limited capacity to pay VKC Bills (e.g., Internet, electricity and salary)

In a meeting with the VKC management committee as part of the project Monitoring and Evaluation mission, it was observed that the VKC was not earning enough money to cover the running costs of the Internet, electricity and salary for the knowledge workers. Instead, the VKC continued to survive on subsidies from the government or some projects using the DRC facility, which enables the DRC and therefore the VKC, to meet electricity and water bills. Payments for knowledge workers to compensate for the time they spend at the centre providing services remain the biggest challenge as the VKC hasn't been able to pay them. As a result, knowledge workers do not report regularly as was the case when the project used to pay them their salaries.

Limited access to smartphones among farmers

The use of social media in the dissemination of agricultural information and knowledge from the VKC using digital platforms largely requires the possession of a smartphone. However, for most farmers, smartphones are too expensive to own. Instead, they own basic feature phones which do not support sharing of multimedia messages that require smartphones. One interview participant noted:

“You see (showing his phone), I have this basic phone (showing a basic phone). It does not support WhatsApp. I neither receive nor send WhatsApp messages. This is a challenge that affects most of us farmers because we cannot afford smartphones” (KII, participant, 16th May 2021).

Lack of personal ownership of smartphones, defined as possession of a handset with access to the Internet and the ability to download mobile apps hindered sharing of messages and technical information.

The limited scope of VKC services

Information seekers require more than information to be able to use information obtained from the VKC. For example, although the VKC provided information and knowledge on crop and animal husbandry, its application requires certain inputs such as fertilizer and improved seeds, among others. In the absence of such inputs, farmers do not see the importance of the VKC. They complained that supplement animal feeds were not available in their area and when available are very costly. This, to some extent, diluted the VKC efforts to improve the dairy cattle sector in the area.

R1: *“Here at the VKC we learn a lot of things. We are grateful that we now have Brachiaria technology. However, we still face challenges in accessing supplement feeds for our dairy cows” (FGD Participant, 15th May 2021).*

The implication of this is that for effective utilisation of information accessed by farmers through any means including through VKC, the availability of support services should be ensured. For this case, it is important to point out that to realise the impact of accessed information, access to support services should be ensured. VKC needs to be linked with other services.

DISCUSSION

This case study has investigated the potential and challenges of the VKC enhancing access to agricultural information and knowledge among small-scale farmers in rural Tanzania, focusing on the potential and challenges of using the facility in EAS. The study has revealed that the VKC has potential, however, some challenges need to be mitigated to realize the potential.

The centre provides the possibility of sharing information between farmers and extension workers or among the farmers using ICT-enabled (mobile phone-calling on station extension officer, WhatsApp group or text messages) and conventional (physical visits) contact methods. The mix of the methods and providing space for co-creation of something has the potential to generate relevant information and improve timely access to the same. Furthermore, studies have demonstrated that mobile phone-based services are linked to increased crop diversity and farmers' adoption of novel agricultural practices (Chhachhar, et al. 2016; Kameswari et al. 2011). Arguably, this is possible due to increased contact efforts and deliberate search of information among the farmers. In this case, contrary to initial assumptions, farmers' contact efforts to access information and use the facilities at the VKC were very minimal. The current findings agree with those of Nchimbi-Msolla et al. (2018), Haug et al. (2021a), Haug et al. (2021b) and Mwantimwa & Ndege (2022).

The findings have demonstrated that even those who visited the VKC mostly sought information on training/education opportunities and Government-related information, than agricultural information which was the focus of the intervention. It could be said that respondents found accessing such information at the centre was cheaper and therefore this was a relative advantage (Rogers, 1968). But they prioritised such information over agricultural information and knowledge. The results support the findings of Kumar & Best (2007) who noted that the costs associated with VKC services were less, and the benefit accrued was greater than the alternatives (a postal letter, telephone call and travelling to town). While the intended usage of the VKC is to enhance access to agricultural knowledge and information, their actual usage seems different in terms of priorities.

Further, it was thought that having the equipped facility that is the VKC in the village community could improve information and knowledge generation, packaging and exchange to satisfy farmers' requirements (Wilson, 2000, Nancy & Jegan 2016), The use is still low. These findings reflect what has been reported by Mwantimwa & Ndege (2022). This could be attributed to many factors, the most important ones are high connectivity costs (ADB, 2017) and limited access to smartphones - since most farmers in the study area owned and used basic phones which provide fewer options for them to access electronically shared messages through WhatsApp and other digital media (Omotesho et al 2012, ADB, 2017). This implies that for VKC to be effective in bridging the theory-practice gap and enhancing the application of newly introduced technologies, dealing with contextual realities alongside new interventions are very important to enhance compatibility.

It can be argued that ownership of compatible ICT facilities by target farmers and affordability of the services could increase usage, as in the rural context, VKC has a relative advantage in terms of saving time, and low cost, compared to conventional methods. But also, as Karuppiah & Rajakumar (2013) noted it can enhance the need-based content generation and dissemination of knowledge through the appropriate use of ICT, thus ensuring connectivity and capacity building (Sanga et al., 2013a, 2014; Mtega & Msungu, 2013; Stoll, 2015; Lwoga & Chigona, 2018). Nevertheless, it should be noted that making VKC services cost-effective and context relevant will probably play a significant role in their functionality and diffusion. This is because, although Mwantimwa & Ndege (2022) claim that the success of VKC is premised on shared values and benefits around smallholder empowerment, knowledge dissemination and innovative extension models, if the costs are unaffordable, such success may not be realized.

Nevertheless, the farmers have a positive reaction to the introduction of new forage – the main achievement of the project, but a key observation is that introducing such innovations needs to be purely participatory. Yes, data show that the VKC establishment process in terms of location, management and operations protocols was participatory, the selection of technology of focus (Brachiaria) was top-down thus leading to technological shortcomings. Despite the challenges discerned, the VKC has the potential to stand as an interface between researchers and consumers of research output based on the experience and lessons from this study.

Apart from making agricultural extension relevant, it can contribute to making the service demand-driven (Chiwasa & Kambewa, 2018). Apart from contributing to improved efficiency, decentralized and demand-driven extension programs have been advocated as one way of ensuring that extension programs meet the needs of various stakeholders including farmers.

CONCLUSION

The VKC offers great potential for improving the delivery of EASs in rural Tanzania. This is demonstrated by timely access to context-specific and relevant information and the number of farmers who have acquired information about Brachiaria technology and have adopted the technology. However, its effectiveness is limited by various factors such as low visiting rate, lack of sustainability and the fact that most farmers are yet to see its relevance in a broad sense. There exists room for improvement that requires addressing impediments to its effectiveness. There is a need to go beyond the provision of agricultural information and knowledge through the VKC. Agricultural information is necessary but not sufficient to promote improved agriculture practices. Hence linkages with input providers should be forged with the centre for farmers' access to supplies.

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