

Harnessing the use of alternative media for South Africa's agricultural extension service delivery in the face of the covid-19 global pandemic

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ABSTRACT

Agricultural extension service delivery remains pivotal in disseminating contemporary and innovative agricultural information, and the training and capacity building of farmers; all of which are critical to increased farmer productivity. There are several agricultural extension methods used by extension field officers to engage their target farmers; some of the contact methods used, like the individual and group methods amongst others, necessitates close interactions between both parties. As such, physical contact between persons cannot be avoided. In the current spate of COVID-19 threats to global health, there is a possible risk of human-to-human transmission of the disease. Some temporary measures like social distancing and the ban of gatherings are currently utilised by many countries to mitigate the rapid spread of the virus. The findings of several research reports showed that these restrictions negatively impacted agricultural extension service deliveries. This paper, therefore, reviewed alternative media delivery mechanisms as a probable palliative measure in sustaining the continuous delivery of agricultural information to farmers. The paper recommends intensifying the use of the electronic extension (E-extension) system. The mobile and computer/web-based platforms should be significantly harnessed (where applicable), while concurrently promoting the intense use of print media, radio, television, agricultural documentaries and instructional videos.

Keywords: Pandemic, Social distancing, Mass media, E-extension platform

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1. INTRODUCTION

The novel coronavirus infection, SARS-CoV-2, was first identified in Wuhan, China in 2019. The virus was codenamed COVID-19 and declared a global pandemic by the World Health Organisation (WHO). This virus is transmitted between people through respiratory droplets and contact routes (Liu *et al.*, 2020). In a scientific report, the WHO (2020) indicates that COVID-19 droplet transmission occurs when a person is in close contact (within one meter) with someone who has respiratory symptoms (e.g. coughing or sneezing,) and is therefore at risk of having his/her mucosae (mouth and nose) or conjunctiva (eyes) exposed to potentially infective respiratory droplets. Droplet transmission may also occur through fomites in the immediate environment around the infected person (Ong *et al.*, 2020). Therefore, transmission could be by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person (e.g. stethoscope). This process of transmission has placed mankind at very serious health risks with no antidote and therefore requires limited human interaction. Presently, there are no vaccines, and as a result, some preventive prescriptions are social distancing, lockdown, use of nose masks, regular handwashing with soap, and hand sanitizers (WHO, 2020).

The agricultural extension is a programme of social change where farmers are supported by extension personnel to engage in self-help activities to meet farmers operating goal. As a result, two contact approaches could be used to reach the clientele: a) personal contact (extension visit, group meeting, farm visit, demonstrations), and b) mediated contact (printed materials, radio, television, online materials, and recorded materials). The South African extension system still relies on the former for extension delivery system. Thus, the current COVID-19 pandemic could be a threat to the frequency of public agricultural extension service delivery that has been at the receiving end of being too expensive in terms of human resources and facilitation needed to reach wider farming communities (Karubanga, *et al.*, 2016). In the event of COVID-19, the situation becomes more challenging in the face of social distancing, masking, lockdown, and other associated restrictions aimed to flatten the COVID-19 curve. The impact of these could place much-untold hardship on the smallholder farmers who depend on the public agricultural extension services for capacity development and advisory services. The poor funding of extension, high ratio of farmers to agricultural extension personnel, and other critical issues (Williams *et al.* 2008; David & Samuel 2014; Montmasson-Clair & Zwane, 2016) have placed extension at a cliff edge, which requires more innovative ways of delivering services that could reach a large number of farmers, especially the highly vulnerable groups. South Africa's

poverty level has reached 59.49% of households of which the majority are located in KwaZulu-Natal, Eastern Cape, and Limpopo provinces (Oluwatayo & Babalola, 2020). According to Husain *et al.* (2020), the resource-poor households are prone to experience the economic or logistical consequences of the COVID-19 pandemic. While the government is striving towards the availability of affordable testing and treatment, to protect the populace from further infections, efforts must be made to see that farming does not suffer many effects as the threat could deepen the poverty and food insecurity of the country.

The threat of massive spreading of the virus could be a reality with the possible risk of human-human transmission amongst extension field officers and individual or group(s) of farmers should any person(s) in the link be infected with mild or no symptoms. The risk of infection from asymptomatic individuals is high as studies (Hanscheid, Valadas & Grobusch, 2020; Long, 2020; Ebrahim & Memish, 2020) have reiterated that COVID-19 can be transmitted from asymptomatic persons. Even though one particular extension contact mechanism cannot be adjudged as the overall best because each has its comparative advantage over the other and apparent lapses (Azumah, Donkoh & Awuni, 2018), the mass media delivery mechanism may prove to be more effective in the current global health crisis of COVID-19.

2. PURPOSE OF PAPER

The purpose of this paper is to review various alternative media mechanisms that could be harnessed to help sustain South Africa's agricultural extension service deliveries especially during the Covid-19 pandemic and any future epidemic that may require social distancing and ban of group gatherings.

3. METHODOLOGY

The authors used electronic academic research domains like Google Scholar, Web of Science, JSTOR and other verified online search engines to obtain the literature used in this review article. The standard for literature search includes - (i) Limiting the search to literature published in the English language only. (ii) Using key search words and phrases like Covid-19 pandemic, transmission, restrictions and regulations, South Africa's public agricultural extension system and approaches, mass media, traditional media, new media, E-extension platforms, mobile platforms and Information and Communication Technologies (ICTs) for extension, amongst others. (iii) Drawing out relevant information from mainly, peer reviewed journals and grey literature. The authors narrowed down their information sources to a combined total of seventy-six scientific papers and non-traditional

publications consisting of published research papers in peer-reviewed journals, books, report literature, government publications, working papers, and conference proceedings.

4. THE NEED FOR SOUTH AFRICA TO ADOPT ALTERNATIVE MEDIA USAGE

South Africa (SA) inherited a dual agricultural system that consisted of a heavily subsidised and well-protected white commercial sector juxtaposed with a neglected African subsistence sector that continues to exist even today. The South African agricultural extension and advisory services field officers are required to provide services to farmers in both divisions (Liebenberg, 2015). However, the well-established commercial farms may rely less on the services of the public agricultural extension but not on most of the resource-poor smallholders.. The lingering challenge has however been the lack of sufficient extension workers in providing services to the large numbers of these resource-poor farmers spread around SA, mostly in the former homelands. For instance, the Eastern Cape, KwaZulu Natal, Limpopo and Mpumalanga provinces are severely challenged with having insufficient field officers to execute adequate extension services in the provinces (Liebenberg, 2015). This situation is not uncommon in many countries. For example, India and Nigeria are also faced with similar constraints (Bhattacharyya *et al.*, 2018; Ifejika *et al.*, 2019). Asides from this, many other issues associated with the F2FEM include untimely dissemination of information, geographical distances, poor roads and transportation services, and lack of proper communication infrastructure (Abdullahi, Shehu & Sani, 2016; Sani *et al.*, 2018). For these reasons, there have been calls for the need to harness alternative means of agricultural extension service delivery through the employment of information and communication technologies (ICTs). The challenges of the novel COVID-19, however, unexpectedly make the adoption of ICTs imperative.

According to Wu and McGoogan (2020: 4), there is a need “to be even better prepared to respond to future new public health threats”. The mass media contact method may just be the optional delivery mechanism that needs to now be effusively harnessed in order to sustain extension service delivery while battling with overcoming COVID-19 and any other potential global pandemic that may surface or re-surface. This is especially crucial for South Africa; a research paper (Davis *et al.*, 2019), revealed that extension field officers in SA still prefer and mostly utilise the group and individual extension service approach. In the study titled “Extension officers’ perceptions of extension and innovation in South Africa”, selected extension officers were asked to rank their most preferred and least preferred method of interacting with farmers, and they were also required to identify the most utilised method. The listed methods included – ‘working with individuals, working with groups, inter-

institutional and coordination work, and use of mass media. Results from the study indicated that the most practised was the group method while the most preferred remained the individual contact method. The inter-institutional coordination was ranked third while the mass media was the least preferred and used method. The findings raised critical concern “Is public extension in SA not missing opportunities to take advantage of the potential of mass media”? (Davis *et al.*, 2019: 157). This question has become all the more pertinent since agricultural extension work has to continue regardless of the COVID-19 challenges. South Africa’s agricultural extension services need to reengineer their service delivery systems through e-extension.

In Africa, the use of e-extension services is not new. For example, in Kenya, the government has put in place a number of virtual and mobile-based platforms for use by its agricultural extension officers and also provided them with relevant ICT tools to facilitate the use of these media platforms (Gichamba, Wagacha & Ochieng, 2017). Afzal, Al-Subaiee and Mirza (2016) referred to literature that suggests that e-extension methods have been successfully utilised to execute extension service delivery in many countries. As such, further remedial actions are required in South Africa’s public extension service delivery to aid in relieving farmers’ vulnerability. According to Leeuwis (2013), there could be changes in the challenges faced by farmers. Therefore, organisations responsible for supporting farmers in dealing with their challenges have to unremittingly modify their support strategies in order to productively combat those challenges. Thus, the new capacity building on e-extension will be critically required at individual and administrative levels for articulation and efficient performance of agricultural extension roles that will impact positively on the farmers’ productivity and improve the relevance of public agricultural extension services.

5. USE OF ALTERNATIVE MEDIA MECHANISMS FOR EXTENSION SERVICE DELIVERIES IN RESPONSE TO THE COVID-19 PANDEMIC.

South Africa’s extension and advisory service (EAS) providers need to move with the current tides. It is essential to enhance their current operational modes of information delivery and innovate new interactive ways to manage social distancing. According to a recent report by the Food and Agriculture Organisation [FAO] (2020), going digital seems to be one of the critical adaptation delivery mechanisms for EAS:

Digital tools and technologies enable information flow in spite of physical distancing and mobility constraints. Explore simple, available and accessible, and easy-to-implement Information and

Communication Technologies (ICT) solutions such as short message service (SMS), Interactive Voice Response (IVR), radio and television (TV), drones, online marketing, e-extension platforms, social media. (FAO, 2020:3).

The E-extension platform has been widely recognised for EAS delivery across the board. The platform involves delivering extension services with contemporary ICTs which include but are not limited to mobile and computer/internet technologies and their vast applications like voice calls, SMS, instant messaging, WhatsApp, blogs, podcasts, social media, e-mail, videos and other audio/audio-visual aids and web portals/services (Gichamba, *et al.*, 2017; Bhattacharyya *et al.*, 2018; Lubell & McRoberts, 2018; Ifejika *et al.*, 2019). According to Saravanan *et al.* (2015: 85), a number of these applications have “the potential to provide a wide range of services (information, awareness, promotional, advisory, knowledge, technology transfer, training, education, and much more) to farmers and other agricultural innovation system (AIS) actors in a timely, comprehensive, cost-effective, and interactive manner”.

Many developing countries are already exploring the use of mobile platforms (Gichamba, *et al.*, 2017). Prabha and Arunachalam (2019) noted that mobile phone-based extension could be used to alleviate the many challenges that come with the use of the traditional extension approach. It has a great potential for use in extension services (Jallo, 2016). In Mavhunduse and Holmner’s (2019) view, the use of mobile phone technology should not be seen as a shift away from the conventional face-to-face interactions but rather, a means to enhance it. According to Kim and Garrison (2009), mobile wireless technology usage is on the increase and its use has gone beyond the typical voice communication as multiple contemporary forms of services like text messaging, web browsing and other m-commerce (commercial transactions conducted electronically by mobile phone) activities are being incorporated into the technology. This has brought about the evolution of Smartphones which allow users access to vast mobile applications, the majority of which are free. The computer (hard and soft wares), the internet and its numerous forms of web applications are considered the most significant ICT devices of the new media (Saleh *et al.*, 2018). Internet web applications like social media comprise a vast number of tools for creating and sharing information and also allow for active participation, interactions and collaborations, among users (Barau & Afrad, 2017; Thelwall & Vis, 2017). Some of the common social media tools include social networking sites, blogs and vlogs, micro-blogs, virtual social worlds, videos, photos, audios, forums, and socially integrated messaging applications (Indian Council of Food and Agriculture [ICFA], 2017).

As COVID-19 infections continues to spread, it is critical that EAS further explore the use of recent web applications that could potentially aid the sustenance of extension service delivery.

5.1 Zoom and Skype video technologies

Many contemporary technologies now allow us to hold individual and group meetings without essentially being in the same physical space. The Zoom and Skype technologies in particular have seen an immense boost in use in recent times due to the COVID-19 pandemic as they have become global digital media alternative tools for sustaining human interactions. Zoom and Skype have become important online interactive tools for local and global meetings and have proven to be quite effective despite a number of flaws found to be associated with their use. They offer similar services: allow interactions between persons by voice, videos, instant and SMS messaging. Both are user friendly and allow multiple participants, can be used for video conferencing, project collaborations, information sharing and recording or storing of meeting sessions for future referencing (Center for Innovation in Teaching and Research [CITR], 2019; Chawla, 2020). Zoom in particular has become significantly popular for video conferencing with its added benefits of low network bandwidth utilisation (Mohanty & Yaqub, 2020). In essence, the use of these technologies may be explored in sustaining extension group meetings with farmers. The major difference would be that such meetings would become virtual rather than physical and would involve extension field agents meeting virtually with groups of farmers outside of the regular face-to-face group interactions.

5.2 YouTube video technology

Literature (Kipkurgat, Onyiego & Chemwaina, 2016; Saravanan & Suchiradipta, 2017) has pointed out Youtube, Facebook and Twitter as critical social media tools for propagating agricultural and extension activities. In Barau and Afrad's (2017) view, these online forums have immense potential that extension institutions could explore to reach out to their clients. "We particularly emphasize the role of social media platforms such as Twitter, Facebook and LinkedIn as innovative extension tools for building knowledge networks, coordination, communication, outreach and education" (Lubell & McRoberts, 2018). YouTube, for example, has become a major online video-sharing media and information source (Madathil *et al.*, 2015), with a daily record of over one billion views (Reino & Hay, 2016). It keeps expanding at a swift pace and is posited as the second most surfed online platform in the world (Arthurs, Drakopoulou & Gandini, 2018). It is a free viewing website, highly user friendly, easily accessible by any individual with any form of web-connected device and there are no

restrictions on the number of videos that can be posted by registered users (Naslund *et al.*, 2014; Lee, Seo & Hong 2015). It means that there are no limitations to the forms or volumes of informational or instructional videos that extension institutions can share on the website.

According to Saravanan and Suchiradipta (2013), many agricultural institutions now make use of YouTube to share videos that could assist agricultural stakeholders. In Kenya, the Ministry of Agriculture (MoA) KARI disseminates informational videos via YouTube (Kipkurgat *et al.*, 2016). For example, the poultry division at KARI Naivasha has formed a forum on YouTube where there are interactions with indigenous chicken producers who are trained on the platform in the management, housing, feeding and disease control of indigenous chickens (Irungu, Mbugua & Muia, 2015). While in India, YouTube has become quite popular as an information site for the animal husbandry with such information available in Hindi and other sectional Indian languages as the use of indigenous languages in the transmission of information remains a critical factor (Thakur & Chander 2018). There are also extension initiatives in Pakistan where extension informational videos are shared using sites like YouTube; farmers are able to get feedback for their questions through several other sources (phones and e-mails) and such feedback is also made available on the video website (Jallo, 2016). As such, the use of YouTube could be further explored to supplement extension service delivery.

5.3 Facebook

Facebook facilitated interactions have widened the prospects for engaging with diverse minds (Ferris & Hollenbaugh, 2018). For instance, individuals with related interests can generate groups or become members of such groups using “Facebook Groups” and “Fan Pages” applications (Lenzi *et al.*, 2015). These functions are part of what promotes Facebook (Cervenkova *et al.*, 2011) as a compelling interactive media platform. Eghdam *et al.* (2018) described the Facebook group function as expedient for people with mutual interests to discuss issues, share ideas or post content. Significant characteristics of the Facebook Group include the capacity and willingness of its users to: “post and share relevant information beneficial for the group members; raise awareness on certain issues related to the special interest group description and purpose; raise questions on certain issues; get consensus or gain understanding about another member’s perspective on certain issues; and to “meet” new people who share similar interests” (Lijadi & van Schalkwyk, 2015: 2 & 3). According to Stanley (2013), Facebook has no limitations on character usage and as such, it gives room for comprehensive

discussions in its forums. Photos and videos can be uploaded, chats, e-mails and other contents are also important features (Chisenga *et al.*, 2014) that can be maximally utilised for learning purposes.

6. EXISTING CHALLENGES TO USING E-EXTENSION

Many underlying factors could indeed impede harnessing E-extension technologies, especially now that they are more needed. The Eastern Cape Province, for instance, is one of the poorest provinces with extreme poverty mostly affecting its rural and semi-formal areas (Mathebula *et al.*, 2017). Poverty intensity is a foremost developmental challenge for the province (Sipungu, 2016); as such, rural smallholder farmers may not be able to afford the cost of purchasing personal ICT devices. To make use of Zoom, Skype, YouTube, Facebook and other virtual media tools, farmers must have access to computers (Desktop PC, Laptop, Tablet, Netbook) or Smartphones along with other accessories like webcams, speakers or headphones. Rural households' access to these devices in many developing countries is still significantly limited. ICT technologies and web connectivity in rural areas are insufficient (Saravanan *et al.*, 2015); and ICT policies aimed at empowering farmers with relevant technological tools have been ineffective (Abdullahi *et al.*, 2016), coupled with poor connectivity and the high cost of internet access (Saravanan & Suchiradipta, 2015; Nwabugwu, Nwobodo & Okoro, 2019).

The efficient use of the devices also requires adequate technicalities. The IT aptitude of coordinators and participants for virtual interactions is a critical factor (The Global Fund, 2020). There are no two ways about it; knowledge of ICTs and the use of web applications are significant to have a high success rate of virtual agricultural extension service delivery. It only accommodates literate and virtually inclined users (Saravanan *et al.*, 2015). Arguably, rural farmers' illiteracy level in ICT use is significantly high as the majority lack access to technology training (Abdullahi *et al.*, 2016). As such, this group of farmers hardly benefit from the use of such technologies (Chhachhar *et al.*, 2014). Technical issues could be encountered in the course of the use of such applications as well as the complexity of use (Nwabugwu *et al.*, 2019; Deloitte, 2020), especially for agricultural extension officers and farmers who lack IT literacy. This extensively limits the scope of use of such media tools; in addition, there is still a lack of awareness and unwillingness to accede to using these applications by a number of agricultural extension experts and farmers (Saravanan & Suchiradipta, 2015). Despite this, many countries like Kenya (Gichamba *et al.*, 2017; Tata & McNamara, 2018) and India (Bhattacharyya *et al.*, 2018), amongst others, are beginning the transition to using E-extension systems for providing extension and advisory services to their respective farming communities. At

the present, only South Africa's literate and elite farmers could benefit from the use of these potential extension service alternative media mechanisms during this COVID-19 pandemic. However, in the not-too-distant future, rural farmers could indeed also benefit from these new media tools if issues regarding access to ICT infrastructures, data and internet connectivity, E-extension awareness and technical training for agricultural extension officers and farmers are given priority.

6.1 Radio

The radio and television have been referred to as the most efficient electronic media for the rapid dissemination of innovative agricultural information to farmers, regardless of their educational status and geographical location (Akshaya Kumar & Vijayakumar, 2017; Ali, 2018). They play significant roles in the capacity development of farmers through the broadcasting of diverse agricultural programmes (Chhachhar *et al.*, 2014); and, such programmes have been used to provide agricultural advisory services through recorded programmes or live programmes which are sometimes interactive (Gichamba *et al.*, 2017). The community radio, especially, has been found to be an effective medium for reaching out extensively to rural farming communities. As such, it has become extremely instrumental in engaging local communities. According to literature (Mugwisi, 2015; Okeke, Nwalieji & Uzuegbunam, 2015; ICFA, 2017; Balamurugan, 2017), radio is an important extension service delivery tool, inexpensive to use, has a wide outreach, is suitable for local environments and people with low educational status, can be used in areas lacking electricity and even allows for the active participation of listeners where they are allowed to call in, send in texts and freely interact with experts.

6.2 Television

Television has also proven to be a significant extension of information delivery medium. Television is being utilised to disseminate contemporary scientific and agricultural information to farmers and also gives room for interactions with agricultural professionals (Chhachhar *et al.*, 2014). According to Akshaya Kumar and Vijayakumar (2017), farmers gain insights into agricultural operations and technologies via television. It differs from the radio in the sense that it is a multimedia mechanism that functions with a combination of features that include motion pictures, photographs, drawings, slides and recordings (ICFA, 2017; Balamurugan, 2017); but like the radio, it is used to transmit agricultural advisory services through recorded or live programmes (Balamurugan, 2017). Kiptot *et al.* (2016: 107) indicated that countries like the United Kingdom, United States, Thailand, Tanzania, Rwanda, Kenya, Uganda and Bangladesh are already creating and airing edutainment television

programmes that are yet to be initiated in many other countries. Despite its huge potential as an agricultural extension medium, Vignare (2013) and Kiptot *et al.* (2016) listed a number of constraints associated with its use. Some of the constraints include the high charges per programme, less participation and interaction, language restrictions, cannot be used without access to electricity, and, its penetration particularly in developing nations is still minimal, and as such, maybe less impactful as an extension and advisory service delivery tool.

6.3 Video

Videos as an ICT, particularly the digital ones, have been characterised as relatively new (Bentley, Chowdhury & David, 2015; Davis & Sulaiman, 2016). Primarily an audio-visual means of communication (Van Campenhout *et al.*, 2017), there have been calls to promote its use in extension as an alternative to the traditional face-to-face system (Karubanga *et al.*, 2016). In Uganda for instance, Cai, Abbott and Bwambale (2013) described how developmental agencies have carried out trials with the use of instructional videos to supplement or even substitute the conventional F2FAE approach. The authors held that videos have indeed proven to be an effective extension training mechanism and posited ‘video-only’ training as a suitable approach, especially in situations where there are a limited number of extension field officers to execute the traditional face-to-face training. Studies (Chowdhury *et al.*, 2015; Van Campenhout *et al.*, 2017) have asserted the effectiveness of videos as an agricultural extension teaching and learning tool, as it is pertinent in creating awareness, stimulating resourcefulness and innovative development, facilitating training and farmer-to-farmer extension (Bentley *et al.*, 2015; Sousa, Nicolay & Home, 2016).

There are many upsides to using videos as an extension mechanism, some of which include its visual and audio power, standardisation and ease of presenting technical information, wider reach, and an otherwise time-consuming training process that could be presented in videos at the shortest possible time (Bentley *et al.*, 2015). They could be burnt in lightweight cassettes or compact discs and multiple copies for easier and faster distribution (Mugwisi, 2015). According to Cai *et al.* (2013), farmers could be more exposed to regular training as they do not have to wait for experts; furthermore, running and labour costs may be reduced in the long run as the distribution of videos becomes self-propagative after a while. An important aspect of the use of videos for training is availability. Also, farmers can keep replaying videos until they are able to understand their content and apply what they have learnt in diverse contexts (Van Campenhout *et al.*, 2017). Cai *et al.* (2013) pointed to literature that concedes that the process of replaying videos helps farmers to think deeply and critically and boost their

confidence level in the ability of innovative practices. This shows that videos have the power to stimulate proactive learning (Karubanga *et al.*, 2016).

7. CONCLUSION AND RECOMMENDATIONS

The COVID-19 pandemic may just be a good enough reason why there is a need for South Africa's extension system to subscribe more to extensively using various forms of alternative media in disseminating innovative agricultural information. The focus, therefore, is on how to make robust the use of the traditional and contemporary mass media for extension service delivery in the face of a global health crisis like the COVID-19. It should however be emphasised that the use of specific ICTs for extension service delivery is dependent on the target population. There is the need to look into ways by which resource-poor farmers, particularly those in rural communities, could have access to and be trained in the utilisation of some basic ICT applications.

The study, therefore, suggests the use of radio and television because of their flexibility, high percentage of usage in SA and ease of accessibility. Agricultural radio broadcasts using both the community and national radios could be harnessed using key approaches such as the transmission of recorded programmes and/or the use of live broadcasts and phoning-in that would make for better participation. E-extension on television on a specific day of the week would also add flavour to the extension delivery services. The use of mobile-based platforms and applications like voice calls, SMS and WhatsApp should also be intensely encouraged and explored, while concurrently promoting the use of agricultural documentaries or instructional videos that could be burnt into CDs and DVDs for widespread distribution.

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