



A survey of communication media preferred by smallholder farmers in the Gweru District of Zimbabwe



Rachel Moyo*, Abiodun Salawu

Department of Communication, North West University, Private Bag X2046, Mafikeng, 2735, South Africa

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ABSTRACT

This study is a quantitative survey of communication media preferred by smallholder farmers resettled under the Fast Track Land Reform Programme (FTLRP) in the Gweru district of Zimbabwe. Data were gathered using a questionnaire and simple random sampling. Communication is integral to agricultural development, particularly so in the context of the FTLRP characterised by a dearth of information, education and training, ensued by the discriminatory command agriculture (Murisa and Chikweche, 2015). Farmers' preferences of communication media in receiving agricultural innovations should be prioritised to improve agricultural communication and subsequently, productivity, which is dire in Zimbabwe in the light of the continuing food insecurity. The findings indicated that farmers prefer media that are stimulating and engaging such as television and demonstrations; convenient such as mobile phones and detailed such as books probably because the majority of them do not have training in agriculture. Demographic variables of age-group and education were found to be associated with communication preferences of some media. The study has implications for agricultural communication media policy. Beyond prioritisation of farmers' preferences, a model of a multi-media approach to agricultural communication has been developed, that could widen communication reach if implemented.

1. Introduction and background

Communication is a crucial aspect of every development facet, particularly so in the context of the FTLRP characterised by a dearth of information, education and training, ensued by the discriminatory command agriculture in Zimbabwe (Murisa and Chikweche, 2015). Viewed in this light, communication processes should be prioritised in development programmes to strive towards achievement of the anticipated development goals. The concept of development is particularly significant in developing countries; therefore, all stakeholders should converge in order to come up with the best communication strategies to promote development in these countries. Zimbabwe is one example of such countries that are grappling with development issues. The study conceptualises that the FTLRP has played a leading role in the declining agricultural productivity.

Apparently, smallholder farmers have increased in Zimbabwe after the year 2000 FTLRP in which the Government acquired approximately eleven million hectares of land from previous commercial farmers. The government redistributed this land under the contested Zimbabwe Agricultural Policy Framework's (ZAPF) objectives of achieving food security (Manyeruke et al., 2013: 278–279). Smallholder farmland, which is categorised under the A1 model in Zimbabwe, is whereby each

white farm was divided into forty to fifty farm units of six hectares of arable land (Manjengwa et al., 2014: 3). Model A1 was intended to decongest communal areas and was targeted at land-constrained farmers in communal areas. Yet research indicates that food shortages continue to prevail in the country (Food Security Brief, 2012; The Emergency Appeal, 2012). Although the appropriation and redistribution of targeted agricultural land under the FTLRP appears to be approaching completion, the economic potential of the reform is yet to be realised (The World Bank, 2016).

The anticipation is that food productivity could be improved in the country if farmers are actively engaged in the communication of agricultural development. This could be made possible through effective strategies and relevant as well as accessible communication media enhanced by relevant technologies (Chhachhar et al., 2014: 281). However, farmers are not benefiting from communication technologies to learn about agricultural innovations due to lack of knowledge, information and training about them (Chhachhar et al., 2014). Therefore, investigating the communication media preferred by smallholder farmers could guide agricultural communication agents on how to design effective and tailor-made communication media to impart agricultural innovations.

Communication media preferences of smallholder farmers were

* Corresponding author. Department of Communication, Central University of Technology, Private Bag X20539, Bloemfontein, 9300, South Africa.
E-mail addresses: moyorachel@gmail.com (R. Moyo), Abiodun.salawu@nwu.ac.za (A. Salawu).

inquired due to the concern that the rushed and haphazard nature by which farmers were resettled made it impossible for adequate training and personnel that could enhance immediate take off and improved productivity. Smallholder farmers need risk-mitigating skills and information on diversification alternatives hence the critical importance of effective communication. An earlier researcher, [Hornik \(1988\)](#) encapsulates that agricultural research agencies are unresponsive to the needs of smallholder farmers, in part because they have no regular means of hearing from those farmers through influential channels. This lack of resources to get feedback from the farmers is later reiterated by [Moyo and Salawu \(2018\)](#) in their findings on extension communication effectiveness in the Gweru district of Zimbabwe. Thus, [Rogers \(1983\)](#)'s assertion that communication channels used to diffuse an innovation may have an influence on the innovation's rate of adoption is pertinent. The study was premised on the observation that there is a lack of appropriate communication strategies to disseminate agricultural knowledge and information.

The FTLRP was affected by lack of information, education and training which impacted negatively on smallholder farming productivity in particular and farming in general. Before the 2000 land reform programme, Zimbabwe had a thriving agriculture sector and was a net exporter of food ([Ignowski, 2012: 3](#)). Since the onset of the reform programme, the agriculture sector has been performing dismally ([The Emergency Appeal, 2012: 2](#)), resulting in failure of previously adopted strategies such as the ZAPF to develop into a consistent framework for addressing food insecurity in the country ([Manyeruke et al., 2013: 279](#)). This was exacerbated by different sets of laws, administrations and policies on multiple tenure systems that have created grounds for conflicts, resulting in adverse impact on agricultural productivity ([Rukuni et al., 2006: 532–535](#)). It should not be overlooked that to date, some of the resettled farmers might still lack the necessary knowledge and skills to exploit agricultural communication and development in the light of safeguarding the country's food security.

One of the most notable impediments to agricultural communication in Zimbabwe has been the FTLRP that was implemented with limited resources. Whereas land redistribution in the previous phases was driven by technical assessments and administratively cumbersome procedures, the FTLRP was politically driven, generating tensions that posed a major challenge for government and for the technicians responsible for implementing the redistribution programme ([Pazvakavambwa and Hungwe, 2009, 152](#)). Therefore, it has been argued that among the fundamental reforms that the country needs to embark upon if agriculture is going to play a key role in transforming the economy is the need to reorient agricultural research and extension towards the re-configured agrarian structure ([Murisa and Chikweche, 2015](#)). Developing an integrated and multimedia approach is one crucial way of improving agricultural communication and subsequently productivity (output) and production (variety). Currently, according to [GoZ \(2015\)](#), Zimbabwe does not have a functional long term agricultural policy.

No one media can be regarded the best in communication. Therefore, [Servaes \(2008: 212\)](#) considers multimedia approaches the most effective. As such, audience research, which, among other considerations, establishes a knowledge base regarding the type of media rural people have access to, those they like and those they would love to own, determines to a large extent the proposed choice of media ([Servaes, 2008: 212](#)). Communication for development utilises all available communication tools, including ICTs, traditional tools and the convergence of old and new technologies. In this way, it is innovative and revolutionary ([Davies, 2006: 7](#)). Furthermore, ICTs such as web-based email, websites and list-serves have the advantage of freedom of access; unlimited, multi-media capacity; two-way flow; virtual networking; speedy communication; low entry barrier; reach and flexibility; cross language; wide variety of content, and can be searched according to need ([Gumucio-dagron, 2008: 73](#)). However, problems of access and capacity, cost of being online, language difficulty, lack of

content on some issues, and for some areas, relevance of content, as well as perceived threats have been cited ([Gumucio-dagron, 2008: 73](#)).

Although resourcing partners are said to have worked through NGOs to provide some extension services to smallholder farmers, the technical capacities of NGOs have not satisfied the needs of farmers ([GoZ and FAO, 2012–2015: 11](#)). The majority of vulnerable smallholder communal farmers are located in the Midlands, Masvingo and Matabeleland regions of central and southern Zimbabwe ([Muzari et al., 2013: 226](#)), which are dry ecological zones. The foregoing challenges prompt the inquiry of farmers' media preferences for agricultural communication, thus guiding this quest for a more effective model of agricultural communication. Therefore, it is apt to review available media for agricultural communication in Zimbabwe. The study aims to promote effective communication and increased agricultural output. The survey research questions were drawn from the research objectives and the literature. The objectives of the study were to: 1(determine media preferences for agricultural communication, of smallholder farmers resettled under the FTLRP in the Gweru district; 2) find out whether or not the demographic variables of the farmers are associated with their communication media preferences.

2. Major media for agricultural communication in Zimbabwe

In Zimbabwe, the agricultural information services are available mainly through mass media and extension services. Mass media communication can be accessed via both print and electronic forms. Print media include the Herald, the Sunday Mail, the Zimbabwe Standard, the Independent and "Kwayedza" which provide articles on developments in agriculture ([Chisita, 2010: 11](#)). Electronic media include radio stations namely; Radio 2 and 4, and national television which are said to provide agricultural programmes on a regular basis. The extension medium of communicating agricultural information is through AGRITEX programmes and services. AGRITEX also provides agricultural information through liaising with other information agencies like media institutions, schools, colleges and community centres. It also collaborates with other resource endowed institutions to deposit its material in institutional repositories ([Chisita, 2010: 11](#)). The following are particular examples of media for agricultural communication.

2.1. Print media

Print media provide news on current events and address specific topics in agriculture ([Mugwisi, 2013: 52](#)). The Herald, for example, provides a weekly report on agricultural news. Farmer organisations, input supply companies, and other organisations disseminate information in the form of pamphlets, posters and magazines on various aspects of agriculture. The Seed Company of Zimbabwe produces agronomy reports and producer manuals which are used by extension workers and farmers. AGRITEX has a publication unit which produces in-house publications, including booklets and manuals, and these are used for training as well as for extension purposes ([Mugwisi, 2013](#)).

However, the major challenge noted with print sources of information is the language of publication, which is mostly English, although materials in Shona and Ndebele are also available ([Mugwisi, 2013](#)). Minority languages like Shangaan, Tonga, Kalanga, Venda and Sotho are often left out ([Mugwisi, 2013: 52](#)). The linguistic challenge noted by [Mugwisi](#) in the production of print media could be addressed by enacting an inclusive language policy to cater for the heterogeneous linguistic groups. However, whether the resettled smallholder farmers have easy access to these print media forms or not has to be researched and this can be inferred through enquiring their media preferences.

2.2. Broadcast media

According to [Chisita \(2010: 5\)](#), in Zimbabwe, radio is widely used as the main broadcast medium to communicate with a wider audience of

listeners even though it is subject to restrictive regulation. Chisita articulates that this medium falls short as a channel for sharing knowledge on demand because of the politicised and momentary nature of broadcasts. The country's major radio stations run agricultural programmes in the vernacular (mainly Shona and Ndebele) and these can be accessed by the marginalised people on short wave frequencies on a daily and often weekly basis. Commendably, the programmes are interactive in the sense that they afford listeners the opportunity to phone in and ask questions pertaining to agriculture (Chisita, 2010).

Television broadcasting is dominated by the Zimbabwe Broadcasting Channel. The most prominent farmer programme is "Talking Farming", where guests are invited from AGRITEX, Department of Research and Specialist Services and other private organisations to address specific topics. Viewers get the opportunity to phone in and ask questions or participate in the discussions. The interactive nature of these programmes helps to attract a wider audience (Mugwisi, 2013: 53). However, farmer satisfaction with the topics, duration and frequency of these programmes remains largely unexplored.

2.3. Freedom fone project

"Freedom Fone" (Dial up Radio) project was conceived and developed by Kubatana Trust of Zimbabwe in 2008 (Chisita, 2010). In using this facility, interactive voice menus can be programmed to provide localised and multi-language agricultural information on demand. Callers can navigate via keypad or voice, and 'Freedom Fone' has a voicemail feature for providing quick audience feedback for future evaluation or playback. The software does not require internet access. The project has been set nearly 100 times, with confirmed usage by 23 projects in 15 countries (Chisita, 2010). Such a communication medium, which is relatively cheap, suits the profile of resettled farmers who are resource constrained.

2.4. Extension policy and services in Zimbabwe

In Zimbabwe, agricultural extension was introduced by Emory D. Alvord in 1927 when he started out with nine agricultural demonstration workers (Hanyani-Mlambo, 2000: 666). At independence, in 1980, the AGRITEX department was formed and it has concentrated on providing agricultural extension services to the smallholder farming sector as an institutional mandate, while servicing large-scale commercial farmers on request (Hanyani-Mlambo, 2000: 666–667). The agricultural extension workers are responsible for transmitting indigenous knowledge technologies, practices and problems from farmers to specialists and researchers, thus creating a research-extension network that is critical for appropriate research and extension communication.

Lately, AGRITEX's mandate has been to provide general extension services and train farmers in the use of new technologies, aimed at increasing productivity while maintaining a sustainable agricultural production base (Hanyani-Mlambo, 2000). Yet, a critical concern is that the extension agency does not have much new knowledge to transfer to the farmers (Mandizadza, 2009: 84). More so, a critical shortage of extension workers has been retold. For example, a study by Marimira (2010) established that an AGRITEX officer resident at Dunstan farm indicated that he is responsible for about 187 farmers spread in five A1 and seven A2 farms, instead of a stipulated ratio of 1:50, a shortage also acknowledged by (Mandizadza, 2009 and Maposa et al., 2013). This unbalanced extension worker-farmer ratio and lack of expertise results in poor communication.

Farmers have become more heterogeneous, both in production orientation and productivity, requiring varied approaches to adequately address their needs (GoZ and FAO, 2012–2015: 10). In an effort to evolve after the low acceptance of early approaches which were linear in nature, the participatory paradigm emerged (Masendeke et al., 2010: 11). Participation is the active involvement of beneficiaries in

developing situation-specific indigenous knowledge, which they can integrate with outsiders' knowledge and capacities to solve their problems (Masendeke et al., 2010: 15). A number of agricultural extension approaches are said to have emerged in Zimbabwe, including: participatory extension approaches, participatory learning approaches, participatory rural appraisals, rapid rural appraisals, participatory technology development, farmer field schools and innovative farmers' workshops (Hanyani-Mlambo, 2002: 6). However, these approaches have not yet been fully adopted at the operational level (Hanyani-Mlambo, 2002), due to their complexity (Hagman et al., 2003: 6). As the case of the Zimbabwe FTLRP has proved, sudden political turn-arounds can easily disrupt development processes in a devastating way (Hagman et al., 2003: 36).

3. ICT policy and agricultural communication in Zimbabwe

Literature has indicated the increasing role played by ICTs in agricultural communication (Bello and Aderbigbe, 2014: 510; Coldevin, 2003: 21). ICTs enhance stakeholder convergence in sharing information, a view which is in harmony with the participatory approach to communication. According to Chisita (2010: 4–5), the Zimbabwe Academic Research Network has helped to provide affordable internet access to small-scale farmers. Zimbabwe's high literacy rate of 92% makes it easier and faster for farmers to use ICTs (Musingafi and Chiwanza, 2012). ICTs can have a direct contribution to food security at both national and household levels (Stienem et al., 2007). Infrastructural under-development hampers ICTs development and usage in rural areas (Mago, 2013). The absence of ICTs and market information has been identified as causing low productivity in agriculture in developing countries such as Zimbabwe (Mago, 2013: 3–4). However, since efforts are being made to promote the use of ICTs in the country, it is worth reviewing these efforts to validate the current study's quest to widen communication media choices among smallholder farmers.

3.1. ICTs for agricultural development in Zimbabwe

Having realised that the country was driving towards an information society, the Zimbabwe Academic and Research Network was initiated in 1997 by the Research Council of Zimbabwe to promote access to information and electronic communications facilities critical for the appropriate functioning of research and development (Chisita, 2010: 9). The following are some of the major ICTs available.

3.1.1. Internet

Zimbabwe has a total of twelve Internet service providers and these are dependent on 'Com-One', which is a government Internet service provider (Chisita, 2010: 5). Agricultural information is available electronically and can be accessed where connections are available. The Ministry of Agriculture maintains a website from which information on its activities can be accessed (Mugwisi, 2013). However, Chisita (2010) states that currently 'Com-One' has been inactive and has relied on an earth station of a private mobile phone company. Considering that Zimbabwe is said to have a high literacy rate, if trained and infrastructure improves, smallholder farmers could effectively use ICTs for agricultural knowledge and information.

3.1.2. Podcasts

Podcasting allows audio and video content to be downloaded automatically to one's computer and later transferred to an iPod or portable MP3 playback device for listening and viewing at a convenient time and place. Podcasts have been successfully used in Mbire rural district in Zimbabwe (Chisita, 2010). During the rainy season, the area is impassable and infrastructure like electricity, mobile networks and telecommunications are not available. However, with the use of podcasts, agricultural activities increased (Mago, 2013: 58–59). For example, increase in milk production from 0.5 to 2 L per cow per day and

livestock birth rates by a remarkable 18 percent (Gudza, 2010). Use of such media as podcasts by smallholder farmers should be explored to widen information accessibility.

3.1.3. Mobile phones

Ilahiane (2007) notes that mobile phones have transformed the way in which farmers access, exchange and utilise information such as interaction with markets and extraction of current and relevant information critical for decision making. In Zimbabwe, mobile phone services are provided by Econet, Telecel and the government-owned Net-one. In 2009, the country's leading mobile operator, Econet, launched the "3G" technology that allows subscribers to access internet on their mobile phones, thus enabling farmers to engage in e-business and e-agriculture (Chisita, 2010: 6). The current study findings indicate that smallholder farmers prefer mobile phones to other new media forms for agricultural communication which implies that their use for agricultural communication should be promoted.

3.1.4. Social media platforms

Farmers could use cheaper communication platforms such as 'Mxit, 2Go, WhatsApp, Nimbuzz' to share agricultural information. Chisita (2012) contends that a snap internet survey shows that Zimbabwean farmers are using social media to circulate agricultural information. Examples of projects are the Potato Farming in Zimbabwe Group and Aquaculture Zimbabwe Trust that are promoting community-oriented web-based agricultural systems. These have improved potato productivity, freshwater aquaculture and fisheries (Chisita, 2012). One challenge indicated is the poor uptake of the technology by the rural farmers (Mago, 2013: 61). Therefore, extension agents are challenged to package communication via platforms that are accessible on mobile phones which is one of the confirmed new media preference.

3.2. Comment on reviewed literature

In the light of the fact that the consumption of all the foregoing media for agricultural knowledge and information: mass, extension and ICTs (new media,) have posed varied limitations to communication, a more integrative model of agricultural communication could be ideal, thus justifying the current study).

4. Method of research

The study was a cross-sectional quantitative descriptive survey of the case of Gweru district smallholder farmers resettled under the FTLRP of Zimbabwe to determine their preferences of media for agricultural communication. The Midlands region, from where the study population is drawn, falls under the new agro-ecological Natural Region three (NR III) out of five natural regions in the country, and it has decreased by 3% because it has been encroached upon by NR IV Mugandani et al. (2012: 367). The encroaching of NR IV, which is drier, into NR III has exacerbated the vulnerability of smallholder farmers (Muzari et al., 2013), impacting negatively on agricultural productivity and hence the current study's interest in that region.

A sample of 366 farmers was chosen from a population of 7699 smallholder farmers in the Gweru rural district using the Raosoft sample size online calculator at: (http://www.raosoft.com/sample_size.html). The study was based on the case of the Gweru rural district resettled farmers. Simple random sampling was used. A questionnaire guide was used to inquire the common farmer communication needs by determining their preference rankings of given media between June and July 2015. Due to non-returns and missing data, 301 (82%) responses were analysed. The questionnaire took about 30 min to complete and informed consent was sought from the respondents. Section A consisted of demographic details while section B comprised media forms to choose from. Data were analysed using the Statistical Package for the Social Sciences (SPSS). The study associated the respondents'

demographic variables (gender, age-group and education level) with preference of agricultural communication. The associations were analysed by applying inferential statistics using Chi-Square tests.

5. Findings and discussion

The objectives of the study were 1) to determine media preferences for agricultural communication, of smallholder farmers resettled under the FTLRP in the Gweru district and 2) to find out whether or not the demographic variables of the farmers are associated with their communication media preferences. The demographic details of farmers could influence their communication preferences in a significant way, and as such, gender, age-group and education level were found to be the most relevant in a heterogeneous setting. There were one hundred and fifty (49.8%) male respondents and one hundred and forty-eight female respondents (49.2%). Three (1%) of the respondents did not indicate their gender. The gender balance was almost equal, thereby attaining an equal voice according to gender. The majority of the respondents (62.8%) were aged 42 years and older. Respondents in the 36–41 years' age-group constituted 16.4% while about 13% were those in the 30–35 years' age group. Approximately 7% of the respondents were below 30 years of age. Concerning education, the majority (61%) of the respondents indicated that they had attained secondary level education. Seventy-one (24%) respondents had undergone tertiary education and forty-three (14%) had attained primary level education. The remaining four (1%) respondents indicated no level of education. The 24% who attained tertiary education are likely to be more knowledgeable about agricultural production and communication since it is anticipated that they are well read. These statistics indicating only a minority with advanced education are convincing that an effective agricultural communication strategy has to be implemented considering that smallholders now occupy most arable land in Zimbabwe (Manyeruke et al., 2013: 278–279). Thus, farmers' preference rankings of given media are presented in Table 1.

These media have been listed on the basis that the literature has revealed that they are some of the main media forms available for agricultural communication in Zimbabwe (Mugwisi, 2013; Chisita, 2010). There were four media forms under each category. Television was the most preferred and ranked the first and most effective, followed by radio, newspapers and the least effective mass media of

Table 1
Communication media preference ranking.

Medium of communication and category	First	Second	Third	Fourth
Mass Media				
Television	X			
Radio		X		
Newspapers			X	
Magazines				X
Folk Media				
Folk drama and songs				X
Master farmer communication			X	
Farmer to farmer communication		X		
Farmers' groups	X			
New Media				
Internet		X		
Satellite				X
Mobile phone	X			
Telephone			X	
Associated Media				
Pamphlets		X		
Charts			X	
Books	X			
Video and audio tapes				X

Table compiled by the researchers.

communication was magazines. The ranking of television and radio as more preferred to the print media is problematic if considering Chisita's (2010) articulation of the politicised and momentary nature of broadcasts in the country. Unlike the current findings where farmers prefer television, elsewhere, 'freedom fone' *Dial up Radio* project is confirmed to have been set nearly 100 times, with confirmed usage by 23 projects in 15 countries (Chisita, 2010). The respondents' choice of television might have been influenced by its attractive nature in the form of visuals which can enhance easier understanding of concepts than mere narration of the same on radio despite that television is momentary too, just like radio. Print media *newspapers and magazines* have been ranked third and fourth probably due to linguistic challenges noted Mugwisi (2013) where the language of publication is mostly English. A consideration of all the native languages could encourage farmers to engage with print media.

Farmers groups' communication was preferred as the most effective, followed by farmer-to farmer communication, then, master farmer communication and lastly folk drama and songs among the four folk media forms given. This finding could have been influenced by the fact that it is likely that farmers consult with other farmers who are familiar with activities in their groups. However, participation in drama and song takes time and requires intensive use of human resources, which is probably why it was least preferred. Mobile phone was ranked the most effective, followed by internet, then, telephone while satellite was least among the four new media forms given. In line with this finding, Iahiane (2007) notes that mobile phones have transformed the way in which farmers access agricultural information. The second ranking of internet confirms the view that the use of the internet is said to have become widespread in Zimbabwe, with organisations increasing their visibility through the web (Mugwisi, 2013). However, Chisita (2010) notes that despite the endeavours, using ICTs for agricultural communication is challenged by low connectivity density and the continued energy crisis in Southern Africa. Inadequate financial resources to fund ICT activities have hindered internet use, particularly by the resource constrained smallholder farmers.

Concerning associated media, books were preferred as the most effective, followed by pamphlets, then charts; and video and audio tapes were the least preferred among the four media forms. Video and audio tapes *podcasts* were the least preferred probably because of the farmers' unfamiliarity with them. This finding is different from that of Gudza (2010), where the podcast *audio tapes* project in Mbire district of Zimbabwe had a positive impact in agricultural production. Low cost media such as podcasts should be made available to the smallholder farmers to widen the communication reach. The findings imply that extension workers should recommend increasing communication through television, farmer to farmer communication, mobile phones and books which the farmers prefer and regard as the most effective communication media.

Findings which sought the farmers' demographic variables indicated that there was no association between gender and the preference rank order of the communication media. However, there was association between the preference rank order and age-group for the following modes of communication: television ($\chi^2(12) = 43.259$, $p < 0.001$), magazines ($\chi^2(12) = 34.376$, $p < 0.01$), farmer to farmer communication ($\chi^2(12) = 23.887$, $p < 0.05$), internet ($\chi^2(12) = 30.105$, $p < 0.01$), satellite ($\chi^2(12) = 27.578$, $p < 0.01$), mobile phone ($\chi^2(12) = 24.346$, $p < 0.05$), telephone ($\chi^2(12) = 30.708$, $p < 0.01$), books ($\chi^2(12) = 21.458$, $p < 0.05$) and video and audio tapes ($\chi^2(12) = 21.321$, $p < 0.05$). The findings differ from one study by Ali (2011: 246) that indicated no association between age-group and adoption of mass media for agricultural information where the results of chi-square tests revealed no significant difference in the education levels between users and non-users of mass media information. Since in the current study, the majority of the respondents' age-group is 42 + years, it could be surmised that they are conversant with the various media categories presented if drawing from literature

Table 2
Preference rankings of extension media.

Extension communication media	Rank
Farmer field schools	2
Farm demonstrations	1
Agricultural shows	4
Look and Learn Tours	5
Innovative farmers' workshops	3

Table compiled by the researchers.

confirming 92% literacy level in Zimbabwe (Musingafi and Chiwana, 2012).

There was also association between the media of communication rank order and level of education for all the media except newspapers and pamphlets. The findings resonate with those of Mittal and Mehar (2015: 11) in which education level is significant for modern ICT which on one hand implies that with increase in education, awareness increases and on the other hand, need to access different information sources arises. Mittal and Mehar's (2015) findings indicate that farmers still try to use traditional media despite their education level but concerning age, much older farmers do not find value in using traditional media due to their extensive experience in agriculture. Since associations were found between age-group and education with media preference, it could be generally concluded that farmers in Zimbabwe are flexible regardless of age-group and education. Therefore, they could benefit from a variety of media if made available.

Findings in Table 2 present the farmers' preferences of effective extension media among the five given. The extension media have been drawn from literature citing their relative newness in Zimbabwe (Hanyani-Mlambo, 2002). Farm demonstrations were ranked the first and most preferred, followed by farmer field schools; innovative farmers' workshops; agricultural shows while look and learn tours were ranked the fifth and least preferred. Therefore, extension workers should consider maximising the use of farm demonstrations in their extension approaches. Look and learn tours were ranked the least probably because they are less educational than demonstrations and could be effective to those farmers with prior knowledge of an innovation. However, the challenge with participatory approaches is that they have not yet been fully adopted at the operational level in Zimbabwe due to lack of resources to harness them (Hanyani-Mlambo, 2002). Considering the low agricultural education revealed in the demographic findings, 61% having secondary education; only 24% having tertiary education; and a significant proportion of 46% having no training in agriculture, the farmers need more involving and educating communication means.

There was association between gender and the ranking of agricultural shows ($\chi^2(4) = 43.027$, $p < 0.05$). There was also association between age-group and the ranking of farmer field schools ($\chi^2(16) = 26.810$, $p < 0.05$) and agricultural shows ($\chi^2(16) = 39.657$, $p < 0.01$). Level of education was associated with the ranking of farmer field schools ($\chi^2(12) = 31.437$, $p < 0.01$), agricultural shows ($\chi^2(12) = 34.169$, $p < 0.01$) and look and learn tours ($\chi^2(12) = 22.495$, $p < 0.05$). Considering that the majority farmer respondents are elderly and have a secondary education, it could be inferred that these could learn from both more and less involving learning approaches presented in the foregoing associations. Arguably, the agricultural communication stakeholders should go beyond the farmers' preferences to facilitate improvement and accessibility of knowledge and information through a variety of media to increase farmers' choices. The findings were limited by the closed nature of the questionnaire, therefore, future research should conduct an in-depth probe of the challenges farmers face with communication media and how these could be overcome.

Since AGRITEX is the professional department responsible for imparting agricultural knowledge in Zimbabwe, a model has been drawn

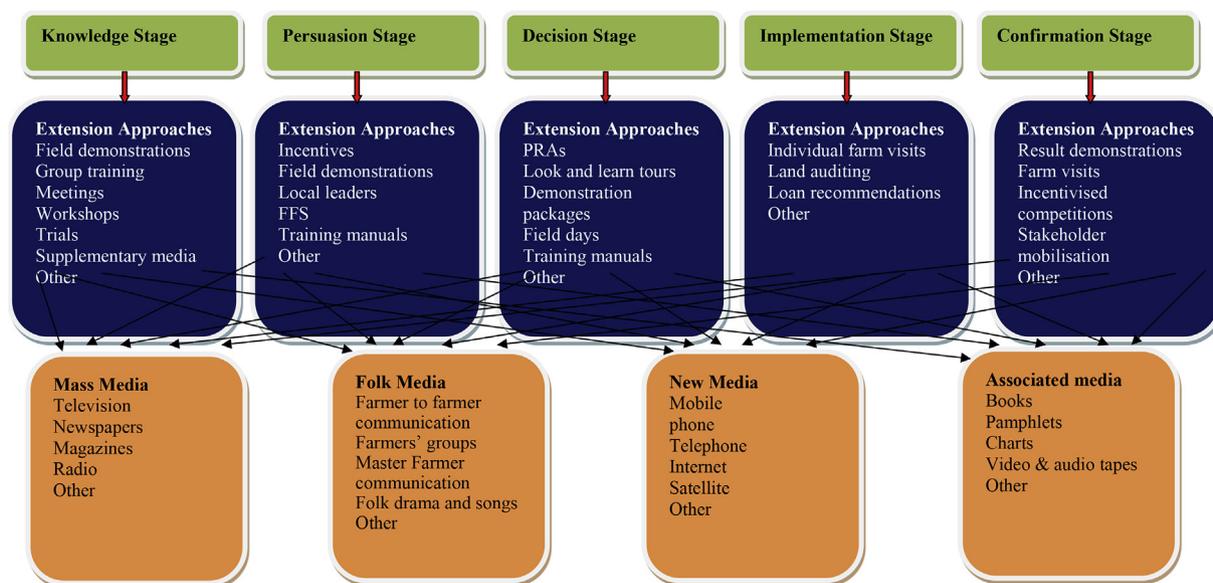


Fig. 1. Model of a multi-media approach to smallholder agricultural communication.

based on the findings of Moyo and Salawu's (2018: 37–38) study indicating the extension methods available to disseminate agricultural information to farmers. These were inquired using Rogers's (1983) five-stepped approach in the diffusion-adoption process. The model has also been drawn in the light of the captured farmers' media preferences in the current study. The model in Fig. 1 illustrates an integrated and multi-media approach to widen agricultural communication reach. The arrows indicate that at each stage of the diffusion-adoption process, the extension approaches, which are the core agricultural teaching and learning methods, should be integrated and supplemented with various other media from the different media categories indicated at all the stages in the diffusion-adoption process, for effectiveness.

The model indicates the four major media categories drawn from literature through which agricultural communication can be channelled: mass media, folk media, new media and associated media to cater for the farmers' preferences. The channelling of agricultural innovations through multi-media widens the communication reach in communities that are geographically dispersed. Furthermore, the multi-media approach increases choices of communication media and that is beneficial to heterogeneous communities. It is likely that a multi-media approach has a high communication impact since it caters for diverse audiences. The repetition of the same messages in various media is also an effective way of reinforcing an idea thus making its adoption likely. The model in Fig. 1 was designed by the researchers.

6. Conclusions

It is concluded that farmers prefer media that are engaging such as television and demonstrations, convenient such as mobile phones and detailed such as books since the majority of them do not have training in agriculture. However, due to the high literacy levels in Zimbabwe as indicated in the literature and the demographic details where the majority had secondary education, a variety of media should be made available to increase farmers' choices. There is an apparent lack of resources in Zimbabwe to improve agricultural communication. In that light, ICTs, which can trump distance and other resource barriers, should be utilised considering that the literature has indicated farmers' use of mobile phones for agricultural information. The study findings build on the diffusion of innovations theory by adding on to linear *mass media*; interpersonal and participatory *extension media*: interactional *new media* which can provide farmers with real time information on demand, and integration of traditional and new media forms to cater for

farmers' heterogeneity. Largely, a multi-media approach to agricultural communication is recommended as it has been found to be likely effective if maximised. Such a strategy could also yield positive results in other communities with the same characteristics as the Gweru district. Most importantly, farmers' media preferences should be prioritised as much as possible.

Declaration of interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrurstud.2018.12.013>.

Abbreviations and Acronyms

AGRITEX	Agricultural Technical and Extension Services (Zimbabwe)
GoZ	Government of Zimbabwe
FAO	Food and Agricultural Organisation
FFS	Farmer Field School (Zimbabwe)
FTLRP	Fast Track Land Reform Programme (Zimbabwe)
ICT	Information and Communication Technologies
NGOs	Non-Governmental Organisations
PEA	Participatory Extension Approach
PRA	Participatory Rural Appraisal
USAID	United States Aid
Zim VaC	Zimbabwe Vulnerability Assessment Committee

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