

## Use of Information Communication Technologies tools among Extension officers in the North- West Province, South Africa.

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**Abstract:** A simple random sampling technique was used to select 169 extension officers to examine the use of information communication technologies among extension officers in North West Province, South Africa. Data were collected with a structured questionnaire and analysed using frequency counts, percentages and multiple regression analysis. The results show that majority of the extension officers were male (76%) with the mean age of 44.6 years, married (79%) and 82.5% were Christians. Forty one percent of the extension officer had Diploma as their educational qualification and a mean of 16.7 years as working experience. The result revealed that extension officers indicated that they used Information Communication Technology tools to source information for various agricultural activities. From a total of the 21 uses of ICT which were listed, 15 uses of information communication technologies by extension officers were to gain access to information on the marketing of produce (1.87), obtaining new information on new technologies (1.85), on new prices of farm produce (1.81), sourcing information on new breeds of animals (1.78), on the preservation of farm produce (1.73), on viewing how to practice new techniques in livestock production and on new processing methods of farm produce respectively (1.72), on presenting seminars to farmers (1.68), obtain information on crop protection (1.66), on obtain information about new variety of crops/seeds and improving efficiency of management respectively (1.65), on project the level of production/hectare (1.64), on obtaining information on feed composition (1.62), on identifying the time of planting of crops and obtaining crop protection techniques respectively (1.61). Significant determinants of use of information communication technologies were educational qualification ( $t = -2.29$ ,  $p = .023$ ); importance of ICT ( $t = -2.02$ ,  $p = .046$ ); constraints to ICT use ( $t = 8.59$ ,  $p = .000$ ) and the effect of ICT on information access ( $t = 4.56$ ,  $p = .000$ ). The study recommends that when extension officers realize the importance of the use of ICT in extension work, the more they can access and disseminate agricultural information.

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### INTRODUCTION

Information and Communication Technologies (ICTs) are all technologies used for the widespread transfer and sharing of information. ICTs are rapidly consolidating global communication networks and international trade with implications for people in developing countries. ICTs in agriculture promote and distribute new and existing farming information and knowledge which is communicated within the agricultural sector since information is essential for facilitating agricultural and rural development as well as bringing about social and economic changes (Swanson and Rajalahti, 2010). The paradigms shift in development concept towards participation and sustainability coupled with revolutions in the information and communication technology has provided opportunities for extension and rural communities to move into the information age (Bhatnagar and Schware, 2000). Agricultural extension, which depends to a large extent on information exchange between and among farmers on the one hand, and a broad range of other actors on the

other, has been identified as one area in which ICTs can have a particularly significant impact.

The paradigms shift in the development concept towards participation and sustainability coupled with revolutions in the information and communication technology has provided opportunities for extension and rural communities to move into the information age (Bhatnagar and Schware, 2000). However, most African countries have not devoted adequate attention to providing their citizens, including farmers, with information which can improve access to finance, land and extension advisory services and the benefits that come along with these services, especially in rural areas where 70 - 80% of the population lives. The situation is no less different in South Africa (DAFF, 2009). Agricultural extension is customarily seen as a means of transmitting knowledge to producers, which is a resource for agricultural production alongside capital, land and labour, all of which, in formal terms, help producers to extend their production activities (FAO, 2004). The effects of the introduction of Information

Communication Technology include contribution to reducing the digital divide at individual, group and community levels; and give voice to the voiceless at household, community, national, regional and global levels (Oladele, Matthew -Njoku and Adesope, 2008).

The rural poor are the engines of agricultural production in developing countries. Agricultural production and post-harvest activities account for the primary livelihood assets and strategies available to the rural poor. Any bottlenecks to improving the general livelihood of the rural poor- lack of health provision, disaster, lack of education, lack of infrastructure, lack of financial services, and many others- will have significant impacts on agricultural production at household, regional and national levels. ICT interventions that improve the general livelihoods of the rural poor may also yield significant agricultural development investments on the part of rural families (Richardson, 1997). The important role played by agricultural extension services in providing linkages and support to agricultural research information and technology transfer for farmers and farming communities has been crucial to agricultural success. Strong criticism of public agricultural extension services has circulated in recent years. This criticism is due to agricultural extension top-down approach, which has been supply- driven, technically weak, patronizing, and catering only to large farmers and providing insufficient coverage of and contacts with farmers (FAO, 2004).

South African farmers receive much advice and information from other farmers and/or private input suppliers, and many also benefit from radio and television programmes, agricultural trade magazines, shows and demonstrations. Despite the different roles and functions that agricultural extension and advisory service should play, much leaves to be desired for the use and integration of ICTs in the agricultural extension and advisory services in South Africa (DAFF, 2009). ICTs are in addition, considered to be drivers of change for rural and agricultural development as they are efficient tools for reaching rural and remote communities and for improving agricultural productivity. Due to this factor, ICTs can speed up the extension of development services in areas that include healthcare, education and agriculture. Furthermore, they can be instrumental in strengthening partnerships and in providing a framework for shared learning (Richardson, 1997). The development and improvement of agriculture worldwide, with specific reference to the African continent and South Africa in particular, requires a paradigm shift on communication and information dissemination. Swanson and Rajalahti (2010) and

Rivera and Sulaiman, (2009) posted that extension services, either general or more specialized exist in many countries to provide information, advice and educate communities relating to many facets of rural life and its improvements. IFAD (2002) reached the conclusion that extension services in Africa have failed to address the needs of small-scale farmers. In another study, Richardson (2006) argues that agricultural extension services that provide agricultural information do not work effectively in Africa. These shortfalls may be due to changes in the extension process that have resulted in the shift to the facilitation and brokerage of information, communication and advocacy services. This range of services, meant to improve rural livelihoods, can benefit from the applications of ICTs. Furthermore, the application of ICTs in agriculture is increasingly important as all stakeholders in the agricultural industry need information and knowledge about the farming phases so as to manage them effectively. The farming phases include amongst others, crop cultivation, water management, transporting of food, packaging and food processing, food quality, food management, food safety and food marketing (Stienen, 2007).

#### **MATERIALS AND METHODS**

The study was carried out in North West province, South Africa. The study population included all extension officers (200) in the province. A simple random sampling technique was used to select 169 extension officers from which data were collected. A structured questionnaire was designed based related literature and objectives of the study and comprised 21 items categorized as uses of information communication technologies. Validity of the instrument was ensured through a panel of experts in the Departments of Agricultural Economics and Extension and extension professionals from the Department of Agriculture and Rural Development, South Africa. The questionnaire had a reliability coefficient of 0.92 using the split half technique. Data were analyzed with Statistical Package for Social Sciences (SPSS) using frequencies, percentages, mean and multiple regressions.

#### **RESULTS**

Table 1 shows the personal characteristics of extension officers in North West Province, South Africa. Table 2 shows the mean and standard deviation of 21 uses of ICT tools by extension officers which were rated on a 2-point scale of Yes (2), and No (1). The result of multiple regression analysis of use of information communication technologies by extension officers were presented in Table 3.

**Table 1.** Personal characteristics of extension officers.

Personal characteristics	Description
Gender Predominantly	male 76%
Age Mean	= 44.6 years SD = 5.40
Marital status	79% married
Religion Predominantly Christianity	82.5%
Educational level Predominantly diploma	41% , BSc =15%
Household size Mean	= 4.8 persons SD = 1.20
Working experience Mean	= of 16.7 years SD = 4.50
Living in job location Predominantly	Yes 79% , No 21%
Job designation Predominantly	extension officer 53%,Senior/Chief agricultural technicians 36%

**Table 2.** Use of ICT by Extension Officers in the Northwest Province

Use	Yes	No	Mean	SD
Gain access to information on marketing of produce.	155 (91.7)	42 (24.9)	1.87	.43
Obtain information on a new technology.	154 (91.1)	15 (8.9)	1.85	.47
Obtain information on new prices of farm produce.	147 (87.0)	22 (13.0)	1.81	.52
Obtain information on new breeds of animals	143 (84.6)	26 (15.4)	1.78	.53
View how to practice new techniques in livestock production.	140 (82.8)	29 (17.2)	1.72	.63
Obtain information on the preservation of farm produce.	139 (82.2)	30 (17.8)	1.73	.600
Obtain information on new processing methods of farm produce.	134 (79.3)	35 (20.7)	1.72	.58
Obtain information on crop protection.	131 (77.5)	38 (22.4)	1.66	.67
Present seminars to farmers.	131 (77.5)	36 (22.5)	1.68	.63
Obtain information about new variety of crops/seeds.	130 (76.9)	39 (23.0)	1.65	.68
Project the level of production/hectare.	128 (75.7)	41 (24.2)	1.64	.67
Improve efficiency of management.	127 (75.1)	42 (24.9)	1.65	.64
Obtain information on feed composition.	126 (74.6)	43 (25.4)	1.62	.68
Identify the time of planting of crops.	126 (74.6)	43 (25.4)	1.61	.70
Obtain information on new processing technique.	125 (74.0)	44 (26.0)	1.61	.69
View new propagation methods of crops.	117 (69.2)	52 (30.8)	1.55	.73
Call the attention of the extension agent.	115 (68.0)	54 (32.0)	1.53	.73
Feed formulation.	115 (68.0)	54 (32.0)	1.53	.73
Receive timely instruction from extension agent on cultural practices.	113 (66.9)	56 (33.1)	1.54	.70
For fertilizer calculations	109 (64.5)	60 (35.5)	1.50	.73
Learn how to carry out budding, grafting, layering etc.	102 (60.4)	67 (39.7)	1.43	.762

**Table 3.** Determinants on the use of ICT tools by extension officers.

	B	Std. Error	Beta	t	Sig.
(Constant)	7.774	4.985			
Gender	-1.470	1.277	-.074	-1.152	.251
Age	.055	.086	.057	.635	.526
Marital Status	-.321	.421	-.049	-.763	.447
Number of children	-.265	.462	-.042	-.573	.567
Religion	-.548	.731	-.043	-.750	.454
Highest qualification	-.738	.321	-.128	-2.297	.023
Studying for a higher degree	1.247	.972	.071	1.283	.201
Household size	.031	.255	.007	.120	.905
Working experience	.035	.068	.043	.511	.610
Living in job location	1.131	1.216	.052	.930	.354
Place of residence	.319	.887	.020	.360	.720
Number of farmers covered	-8.436E-5	.001	-.006	-.106	.915
Distance to farmers	.001	.001	.033	.578	.564
Awareness of ICT	-.072	.045	-.174	-1.616	.108
Availability of ICT	-.045	.071	-.099	-.641	.522
Accessibility to ICT	-.024	.086	-.053	-.277	.782
Competence on ICT use	.058	.069	.142	.842	.401
Importance of ICT	.096	.048	.246	2.016	.046
Constraints to ICT use	.903	.105	.547	8.595	.000
Effect on information access	.148	.032	.280	4.566	.000
Officers e-readiness	.099	.129	.050	.769	.443
F	10.005				
P	.000				
R	.767				
R squared	.588				
Adjusted R squared	.530				

## DISCUSSION

From Table 1, majority of the extension officers were male (76%) with the mean age of 44.6 years, married (79%) and 82.5% were Christians. Forty one percent of the extension officers had a diploma as their educational qualification and a mean of 16.7 years as working experience. There was a mean of 4.8 persons per household and 79% live in their job location, rural or peri urban notwithstanding. In terms of job designation 53% were extension officers. Bembridge, (1991) also reported similar findings in terms of the personal characteristics of extension officers in South Africa. Table 2 shows that from a total of the 21 uses of ICT which were listed, 15 prominent uses of information communication technologies by extension officers were to gain access to information on the marketing of produce (1.87), obtaining new information on new technologies (1.85), on new prices of farm produce (1.81), sourcing information on new breeds of animals (1.78), on the preservation of farm produce (1.73), on viewing how to practice new techniques in livestock production and on new processing methods of farm produce respectively (1.72), on presenting seminars to farmers (1.68), obtain information on crop protection (1.66), on obtain information about new variety of crops/seeds and improving efficiency of management respectively (1.65), on project the level of production/hectare (1.64), on obtaining information on feed composition (1.62), on identifying the time of planting of crops and obtaining crop protection techniques respectively (1.61). Similar findings by Alao (2010) indicated that the impact of ICTs on agricultural development can enhance the integration and efficiency of agricultural systems by opening new communication pathways and reducing transaction costs, gives greater accessibility of information on prices, market survey, farming techniques, farm product and farm outlets. This supports the argument that ICTs can be of vital importance in providing information on relevant agricultural needs of farmers and extension officers. Similarly this observation is corroborated by Lynch (2001) when stating that positive attitude and knowledge and skills of extension experts directly impact the application of ICTs. Aboh's (2008) results showed that 59.60% of the respondents in Imo State, Nigeria used ICT in executing their jobs while 40.40% of the respondents did not use ICT in executing their job. This implies that the number of extension agents who used ICT in their extension services

were relatively predominant. This may be due to benefits of using ICT in extension services which the extension agents have observed.

In Table 3, the independent variables were significantly related to use of ICT with the F-value of 10.005,  $p < 0.05$  showed that there was a strong correlation between independent variables and use of information communication tools. The result further predicted a 58.8% of the variation on the use of ICT by extension officers. Significant determinants were educational qualification ( $t = -2.29$ ,  $p = .023$ ); importance of ICT ( $t = -2.02$ ,  $p = .046$ ); constraints to ICT use ( $t = 8.59$ ,  $p = .000$ ) and the effect of ICT on information access ( $t = 4.56$ ,  $p = .000$ ). It implies that technologies needed are more on the intensity of need. This suggests that as the educational qualification gets higher, there may not be a need to more than what extension officers already have concerning Information Technology because they may have acquired more before attaining that level over the years. On the contrary, Salau and Saingbe (2008) indicated that in Nasarawa State, Nigeria educational level has a positive relationship with the use of ICT and that the higher the level of education the higher the level of ICT utilization and vice versa.

The study showed that the uses of information communication tools by extension officers in North West Province, South Africa were to gain access to information on the marketing of produce (1.87), obtaining new information on new technologies (1.85), on new prices of farm produce (1.81), sourcing information on new breeds of animals (1.78), on the preservation of farm produce (1.73), on viewing how to practice new techniques in livestock production and on new processing methods of farm produce respectively (1.72), on presenting seminars to farmers (1.68), obtain information on crop protection (1.66), on obtain information about new variety of crops/seeds and improving efficiency of management respectively (1.65), on project the level of production/hectare (1.64), on obtaining information on feed composition (1.62), on identifying the time of planting of crops and obtaining crop protection techniques respectively (1.61). Significant determinants of use of information communication tools by extension officers were educational qualification, importance of ICT, constraints to ICT use and the effect of ICT on information access. The use of information communication technologies

highlighted will help extension officers to harness information in improving rural livelihoods.

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