

Constraints related to 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 perceived five of the ten constraints as serious in using ICT's. These specific constraints include: failure of service, poor basic infrastructure that encourages ICT, inability to maintain the ICT, too costly as well as non-availability of technical personnel. Significant determinants of constraints related to ICT use were working experience ($t = 1.80, p = .073$); awareness of ICT ($t = 1.77, p = .078$); effect of ICT on information access ($t = -2.59, p = .010$); officers e-readiness ($t = 2.41, p = .017$) and use of ICT ($t = 8.59, p = .000$). The study recommends that as extension officers become more aware of the use of ICT, the less the constraints related to ICT use will be experienced.

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Introduction

There is a growing demand for improving agricultural production to meet the challenges of food security, especially in the developing countries where the gross national earnings of these countries are low, and cannot afford food imports. Agricultural development by means of introducing technologies, inputs and improved farming practices are becoming increasingly important for the sustainability of agriculture as a promising and economical venture in a long run (Mudannayake, 2006). Therefore the use of ICTs amongst extension officers is of great importance so as to improve and contribute to the development of agricultural production.

The important role played by extension services in providing linkages and support to agricultural research in information and technology for farmers and farming communities has been crucial to agricultural successes in most developed countries. Public extension services have been ineffective in reaching farmers and farm communities with information and technologies needed to ensure food security and sustainable development (FAO, 2004). The situation is exacerbated by lack of skills by extension officers in using ICTs to promote new farming technologies, to enhance the flow of farming information relating to inputs, finance and marketing activities amongst others and bridging the rural digital divide.

ICTs play an important role in maintaining the flow of information within the agricultural macro production system which consists of researchers, extension officers and the farmers. Agricultural extension and advisory service has long been recognized as an important factor in promoting agricultural development in both developed and developing countries. Many countries around the world established organizations for the promotion of ICTs because it is feared that less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already existing economic gap between the technologically 'have' and 'have not' areas (Munyua, 2008). The situation is no less different in Africa and South Africa especially the North-West Province.

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. Furthermore, the Extension Recovery Plan also highlighted that, the extension and advisory service in South Africa needs to be re-skilled and re-oriented because the majority of the extension officers do not have proper skills to use ICTs. The research report by DAFF (2009) highlighted that the North-West Province was amongst the provinces which had a more healthy extension and advisory services. However, the

inefficient use of ICTs by extension officers in the province poses one of the challenges for the dissemination of agricultural information and delivery of agricultural technology. In South Africa, majority (81%) of the extension officers who are in need of being re-skilled and re-oriented, will experience problems and obstacles in using ICTs as a form of accelerating agricultural growth, disseminating and transferring new farming information and technologies (DAFF, 2009).

Leeuwis (2004) states that agricultural extension has the ability to solve many of the challenges that agriculture is facing, but it needs to be made attractive. Indeed, the nature of agricultural extension itself is challenging since it involves working with the farming community (which is not easy as we need to understand rural life and human behavior), have a good knowledge on agriculture (pest and disease management, market prices and opportunities, other stakeholders in agriculture and their role etc.) and have specific skills (good communication skills, listening skills, be a trainer and learner at the same time etc.).

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 10 constraints related to 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 the constraints related to 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. Constraints related to use of ICT among extension officers in Northwest Province

Constraints	Yes	No	Mean	SD
Failure of Service	110 (65.1)	59 (34.9)	1.56	.65
Poor basic infrastructure that encourages ICT.	110 (65.1)	59 (35.0)	1.54	.68
Inability to maintain the ICT	102 (60.4)	67 (39.7)	1.52	.64
Too costly	97 (57.4)	72 (42.6)	1.43	.72
Non-availability of technical personnel.	97 (57.4)	72 (42.4)	1.47	.67
No skillful operator	83 (49.1)	86 (50.9)	1.39	.65
Non availability of genuine components and parts.	78 (46.2)	91 (53.8)	1.33	.69
Fluctuation/shortage supply of electricity.	71 (42.0)	98 (58.0)	1.37	1.05
Fake and substandard ICTs product in the market.	63 (37.3)	106 (62.8)	1.20	.70
Illiteracy	66 (39.1)	103 (60.9)	1.20	.73

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

	B	Std. Error	Beta	t	Sig
(Constant)	.029	3.218		.009	.993
Gender	1.063	.817	.088	1.301	.195
Age	-.035	.055	-.060	-.640	.523
Marital Status	-.146	.270	-.037	-.540	.590
Number of children	-.084	.296	-.022	-.284	.777
Religion	.167	.469	.022	.357	.722
Highest qualification	.315	.208	.090	1.516	.132
Studying for a higher degree	-.066	.626	-.006	-.105	.916
Household size	.126	.163	.051	.773	.440
Working experience	.078	.043	.159	1.805	.073
Living in job location	-.058	.781	-.004	-.074	.941
Place of residence	-.194	.568	-.021	-.341	.733
Number of farmers covered	.000	.001	-.048	-.782	.436
Distance to farmers	6.328E-5	.001	.007	.110	.912
Awareness of ICT	.051	.029	.202	1.776	.078
Availability of ICT	.045	.045	.160	.989	.324
Accessibility to ICT	-.075	.055	-.277	-1.373	.172
Competence on ICT use	-.009	.044	-.037	-.208	.835
Importance of ICT	.015	.031	.061	.471	.638
Effect on information access	-.056	.022	-.176	-2.599	.010
Officers e-readiness	.196	.081	.163	2.415	.017
Use of ICT	.370	.043	.612	8.595	.000
F	8.207				
P	.000				
R	.735				
R squared	.540				
Adjusted R squared	.474				

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 10 constraints, 5 prominent constraints were identified by extension officers as having more limitations to agricultural extension work in the North West Province which were failure of service (1.56), poor basic infrastructure that encourages ICT (1.54), inability to maintain the ICT (1.52), too costly (1.43) and non-availability of technical personnel (1.47). This supports the argument that the problems of poor ICT Infrastructure development, maintenance, electricity and overbearing costs and lack of technical personnel are deterrents to ICT utilization in developing countries.

Similarly, Akpabio, Okon & Inyang (2007) indicated that the major constraint perceived by extension workers in Nigeria was attributed to poor infrastructure development. Ahmadpour, Mirdamadi, Hosseini and Chizari (2010) noted that in Iran the financial factor, plays an important and critical role because the base and setting of e-learning system such as telecommunication infrastructure, buying computer, access to internet, expense of maintenance of equipment and other ICT resources need financial and credit and continuing e-learning projects needs investment. Furthermore, the findings of Khan (2001), Kushner and Chong (2004), and Stribhadung (2006) showed that the high cost of buying and maintaining a system adversely affected the deployment of ICTs.

The findings by Ekwe Agwu and Uche-Mba (2010) revealed that in Enugu State Nigeria, lack of competence in handling ICT facilities, unavailability of hard ware required by modern ICT, poor finance, lack of adequate awareness about ICT, lack of internet access to the rural areas, poor communication network and nature of information provided were considered as serious constraints to the use of ICTs by extension workers. This implies that extension officers who operate from funding hampered and

poor basic infrastructure that encourages ICT and office accommodation are exposed to the continuous failure of ICT service not from the erratic power supply available from the national electrical supply grid. The findings by Salau and Saingbe (2008) indicated that poor supply or lack of electricity supply was rated highest by extension workers in Nasarawa State, Nigeria. Other constraints following the order of magnitude were inability to operate some ICTs, financial problem, poor access to ICTs and lack of interest.

In Table 3, the independent variables were significantly related to constraints related to use of ICT with the F-value of 8.207, $p < 0.05$ showed that there was a strong correlation between independent variables and constraints related to use of information communication tools. The result further predicted a 54.0% of the variation on the constraints related to use of ICT by extension officers. Significant determinants were working experience ($t = 1.80$, $p = .073$); awareness of ICT ($t = 1.77$, $p = .078$); effect of ICT on information access ($t = -2.59$, $p = .010$); officers e- readiness ($t = 2.41$, $p = .017$) and use of ICT ($t = 8.59$, $p = .000$). This suggests that when extension officers acquire more working experience, they will be able to overcome the constraints related to ICT use more, on the contrary, Salau and Saingbe (2008) indicated that years of working experience of extension officers had a negative impact and a negative relationship on the utilization of ICT. The study showed that the constraints related to use of information communication tools by extension officers in North West Province, South Africa were failure of service (1.56), poor basic infrastructure that encourages ICT (1.54), inability to maintain the ICT (1.52), too costly (1.43) and non-availability of technical personnel (1.47). Significant determinants of constraints related to use of information communication tools by extension officers were working experience, awareness of ICT, effect of ICT on information access, officers' e- readiness and use of ICT. The highlighted constraints related to ICT use will help extension officer's e- readiness level to improve and in becoming more aware of the use of ICT as well as the effect of ICT on information access will be influenced by the number of constraints related to ICT use.

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