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Factors determining crop farmers' willingness to pay for agricultural extension services in Tanzania: A case of Mpwapwa and Mvomero Districts

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This study assessed crop farmers' willingness to pay for AESs and identified factors influencing their willingness to pay for AESs. Data were collected from 292 randomly selected crop farmers' households between December 2017 and February 2018 using a questionnaire through face-to-face interviews. Data were analyzed using frequency counts, percentages and Tobit regression model. The study found that 92% of the respondents are willing to pay for AESs. It was also found that farmer's age, education attainment, farming experience, distance from farm to the nearest important road, income (both farm and nonfarm) and attitude towards AESs are significant determinants of farmers willingness to pay for AESs. The study recommends that these variables be given proper policy consideration by the government and other stakeholders in the design and the implementation of a workable fashion of privatizing extension services for the expected impact of improving extension services and farmers' productivity hence improved quality of life.

Key words: Extension services, willingness to pay, crop farmers, Mpwapwa, Mvomero

INTRODUCTION

The importance of Agricultural Extension Services (AESs) in agricultural and rural development is widely acknowledged, particularly in a developing country like Tanzania. Mutimba (2014) opined that agricultural extension is a vehicle for modernizing agriculture in many sub-Saharan African countries. The author adds that it is that discipline of agriculture charged with the responsibility of, as the late 1970 Noble laureate, Norman Borlaug said, 'taking it to the farmer'. Through an educational process, AES provides farmers with the agricultural information in the form of knowledge and skills to build their capacities and influence their attitude so as to enable them take effective farm management decisions regarding their daily agricultural practices (Swanson and Rajalahti, 2010; URT, 2013). According to Birner et al. (2006), agricultural extension entails training of farmers, dissemination of

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Table 1. Initiatives taken by the government to improve the agricultural sector.

Policy initiative	Time frame	Area of focus
KILIMO KWANZA	2009–No time bound	Ten Pillars: National Vision; financing; Institution reorganization; Paradigm shift; Land; Incentive; Industrialization; Science and Technology; Human resource improvement; Infrastructure and Mobilizing Tanzanians
SAGCOT	2010-2030	It seeks to focus on public and private intervention to engage the smallholders in commercial farming
BRN	Originally three years 2013-2016	Three KPI: Promoting 25 commercial farming deals; Enhancing 78 smallholder rice irrigation schemes; and 275 COWABAMA
ASDP II	2016/17-2024/25	Increase productivity, profitability and farm incomes; Promote private sector investment; and address cross-cutting issues

new technologies, assisting farmers to organize themselves, market their agricultural products and create networks with various institutions in order to improve productivity in agriculture and livelihoods. Additionally, AES links farming communities with research where farmers' problems are brought to the attention of research and solutions communicated back to farmers.

Financing and delivery of AESs

In most of developing countries, AES has in the past been, and still remains, almost entirely financed by the public sector, although this may vary from purely public to nearly private services (Ameur, 1994). As more governments face severe financial difficulties, funds are curtailed for support services to agriculture, including extension. In such circumstances, decision-makers usually opt for one or both of the following: (i) to save on the overall cost of public extension; and/or (ii) to gradually privatize extension services, leaving the private sector and users to take on increasing responsibility including covering the cost of service provision (Agbamu, 2000; van den Ban, 2000; Katz, 2002).

Agricultural extension in Tanzania: History and reforms

Agricultural extension service in Tanzania dates back to British colonial rule and has been funded and delivered by the government since independence in 1961 (Mvuna, 2010). Since then several agricultural extension systems and approaches have been implemented which include the gradual improvement in farming methods, the transformation approach, the settlement scheme and the Training and Visit (T&V) system (1980s-1990s). Thereafter, in 1999, Local Government Authorities (LGAs) were decentralized to AESs (Rutatora and Mattee, 2001). In addition, several initiatives have recently been taken by the government to improve the agricultural sector as indicated in Table 1.

Privatization of extension services in Tanzania

Although not formalized, experience shows that farmers in some areas of Tanzania are, in one way or another, already paying for or contributing to the cost of providing AESs. Isinika (2000) reported some examples on attempts to commercialize/privatize AESs: (i) The use of paraprofessionals as an extension strategy. The Mogabiri Agricultural Training Center in Tarime District uses paid (in cash or in kind) Farmer Motivators to assist village extension officers to train groups of farmers. (ii) In Mbozi District under the Agricultural Development Project Mbozi Trust Fund, costs for food are shared where farmers contribute to the cost of training programmes by providing maize flour while the project contributes beans. (iii) In Kondoa District, the Establishment of Plant Protection Brigades project trained young farmers who charged for service provided to other farmers; and (iv) FAIDA-SEP project that is supported by SNV which trains farmers on business awareness and charges them a subsidized rate of 2000/= per course as a cost sharing policy. A more recent study by Lameck (2017) reported that extension agents in Morogoro Municipal and Hai District Councils charge for their services in terms of recovering the cost for transport and the drugs the extension agents use when treating livestock and controlling crop diseases.

According to Schwartz (1992), commercialization of traditionally publicly provided AESs raises several related issues including whether the "fee for service" system would necessarily lead towards greater efficiency and equity. Similarly, Katz (2002) posits that a decision to introduce financial participation should be preceded by a thorough assessment of its feasibility and desirability, which include assessing users' willingness to pay (WTP) for the service. Although several studies have assessed farmers' WTP for AESs in different countries (Abraham et al., 2012; Temesgen and Tola, 2015; Uddin et al., 2016; Aydogdu, 2017) information on crop farmers' WTP for AESs and types of services they are willing to pay for is not well documented in Tanzania. This study therefore aimed at assessing crop farmers' WTP for AESs. Specifically, the study described crop farmers'

demographic characteristics, ascertained farmers' willingness to pay for AESs and the amount they are willing to pay, and identified the factors influencing farmers' WTP for AESs.

MATERIALS AND METHODS

Study area

The study was conducted in Mvomero, a District in Morogoro Region located and Mpwapwa, a District in Dodoma Region. Selection of the study sites was informed by criteria such as agricultural potential and climatic conditions of the two Districts. Mvomero District has a higher agricultural potential while Mpwapwa District has a relatively lower agricultural potential (Phelan et al., 2011). The difference in agriculture potentiality is associated with the difference in agro-ecological zones, Mpwapwa in a semi-arid zone characterized by rolling plains and low fertility susceptible to water erosion and Mvomero in a mixture of highlands and mountains, miombo woodland and Savannah River basin zones, which allow the production of wide range of food and cash crops. Equally important, the main economic activity in both districts is agriculture; so the majority of people are farmers (Sife et al*.,* 2010). This study therefore aimed to establish if there exists any differences in terms crop farmers' feelings about AESs and hence their WTP for the services based on agricultural potential.

Sampling procedure and sample size

The study adopted a multi-stage sampling technique. First, the two districts were purposively selected (reasons stated above). One ward was randomly selected form each of the two districts, Dakawa and Lupeta in Mvomero and Mpwapwa Districts respectively. Thereafter, in each ward one village was randomly selected, Wami-Luhindo in Dakawa and Makutupa in Lupeta. 300 households were randomly selected using sampling proportional to size. That is 137 and 163 from Wami-Luhindo and Makutupa village respectively. The sampling unit was the household while the target respondent was the household head.

Instrumentation and data collection procedure

This study adopted the interview guide (semi-structured questionnaire) as the main data collection instrument. The study followed a Contingent Valuation Method (CVM) using open-ended elicitation technique through face-to-face interviews with heads of household. The CVM uses survey questions to ask respondents to directly value the good or service in a hypothetical market, which, by means of an adequately designed questionnaire, is described where the good or service in question can be traded (Guo et al*.,* 2006). Crop farmers' WTP for AESs was determined by the amount each respondent is willing to pay for a particular item associated with extension service. Any amount other than zero indicated WTP. The items included: agent's travel cost, advice on control of crop diseases, advice on control of crop pests, advice on crop value addition, and advice on crop marketing. A respondent was considered to be willing to pay for AESs if he/she stated the amount other than zero for at least one of the assessed items. A comparison was made between food and cash crops as defined by respondents in the study area.

Data analysis

The collected data were summarized, coded and entered in the International Business Machines (IBM SPSS) Statistics Version 20 and STATA version 12 for analysis. Descriptive statistics such as mean, percentages, minimum and maximum, and standard deviations were computed while Tobit regression model was used to determine the factors that influence crop farmers' WTP for AESs. Tobit model, according to Tobin (1958), is designed to estimate linear relationships between variables when there is either left-or-right-censoring in the dependent variable. In our case, the respondents were to express their WTP for transport cots of extension agent and each of the five categories of extension services (advice on general practices of crop production, disease control, pest control, crop value addition and marketing of crops). A respondent was free to choose to pay for none or any number out of the six choices, making an index score ranging from 0 to 1.

The Tobit model was based on the hypothesis that the likelihood of willingness to pay, y_i depends on a vector of known variables (X_i) and a vector (β, coefficient) of unknown variable.

The standard Tobit model is defined as

$$y_i^* = \boldsymbol{x_i}\beta + \varepsilon_i \ldots\ldots \quad (1)$$

$$y_i = \begin{cases} a \quad if \ y_i^* \le 0 \\ y_i^* \ if \ a < y_i^* < b \\ b \quad if \ y_i^* \ge b \end{cases} \ldots\ldots\ldots \quad (2)$$

where; the subscript i = 1,.., N indicates the observations, y_i^* is an unobserved ('latent') variable, x_i represents vector explanatory variables, β_i is a vector of unknown parameters, ε_i is the error term which is assumed to be independently normally distributed: $\varepsilon \sim N$ (0, σ) (and therefore $y \sim N$ (Xβ, σ)), a is the lower limit of the dependent variable, b is the upper limit of the dependent variable.

Estimation of the model

The Tobit model is usually estimated by the Maximum Likelihood (ML) procedures (Verbeek, 2008). Assuming that the error terms are normally distributed with mean 0 and variance σ^2, the log-likelihood function of the model is

$$logL = \sum_{n=1}^{N} \left[I_i^a log\Phi\left(\frac{\boldsymbol{a}-\boldsymbol{x_i\beta}}{\boldsymbol{\sigma}}\right) + I_i^b log\Phi\left(\frac{\boldsymbol{x_i\beta}-\boldsymbol{b}}{\boldsymbol{\sigma}}\right) + \left(1 - I_i^a - I_i^b\right)\left(log\phi\left(\frac{\boldsymbol{y_i}-\boldsymbol{x_i\beta}}{\boldsymbol{\sigma}}\right) - log\sigma\right)\right] \quad (3)$$

where: $\phi(.)$ and $\Phi(.)$ denote the probability density function and the cumulative distribution function, respectively, of the standard normal distribution, and I_i^a and I_i^b are indicator functions with

$$I_i^a = \begin{cases} 1 \ if \ \boldsymbol{y_i} = a \\ 0 \ if \ \boldsymbol{y_i} > a \end{cases} \quad (4)$$

and

$$I_i^b = \begin{cases} 1 \ if \ \boldsymbol{y_i} = b \\ 0 \ if \ \boldsymbol{y_i} < b \end{cases} \quad (5)$$

Note that the log-likelihood function of the censored regression model can be maximized with respect to the parameter vector (β', σ)' using standard non-linear optimization algorithms (Gujarati, 2004). The variables included in the Tobit model and their expected relationships are subsequently discussed in the paper. Selection of these variables was based on the review of relevant theories and studies similar to the present study. The description of variables and their hypothesized effects are presented in Table 2.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

As indicated in Table 3, of all the 292 respondents,

Table 2. Variables description, coding and expected sign of relationship.

Variable name	Variable description	Expected sign
WTP	**Dependent variable (yes/no response to items of WTP). This is continuous variable taking values ranging from 0 to 1**	
Age	Age of respondent in years	-
Sex	Sex of respondent. 1 if respondent is male, 0 otherwise	+
Education	Was a dummy variable indicating whether a respondent had attended formal education or not (1 if attended formal education, 0 otherwise)	+
HHSize	Number of individuals in the household	+
HHLand	Total household land in hectares own by the household	+
FarmExp	Number of years the household has been engaged in crop production	±
FarmDistance	Distance in kilometers from farm to nearest important road	-
HHIncome	Total annual net income of household in Tanzanian shillings	+
ComCrop	Degree of commercialization of crop enterprise - proportion of crops sold	+
Attitude	Attitude towards AESs. Dummy variable taking value of 1 if favourable and 0 otherwise	+

Table 3. Demographic characteristics of respondents (n=292).

Variable		Distribution of respondents by district						χ^2	ρ-value
		Mvomero (n=133)		Mpwapwa (n=159)		Total (n=292)			
		F	%	F	%	F	%		
Sex	Male	110	79.7	115	74.7	225	77.2	1.187	0.276
	Female	28	20.3	39	25.3	67	22.8		
Age (years)	Below 28	12	9.0	8	3.1	20	5.8	8.515	0.074**
	28 to 38	34	24.1	54	34.6	88	29.8		
	39 to 49	46	34.6	54	35.2	100	34.9		
	50 to 60	25	19.5	31	18.9	56	19.2		
	Above 60	16	12.8	12	8.2	28	10.3		
Marital status	Unmarried	12	9.0	11	6.9	23	7.9	10.315	0.016*
	Married	91	68.4	131	82.4	222	76.0		
	Divorced	17	12.8	13	8.2	30	10.3		
	Widowed	13	9.8	4	2.5	17	5.8		
Education level	No formal education	7	5.3	15	9.4	22	7.5	6.365	0.095**
	Primary school	112	84.2	135	84.9	247	84.6		
	Secondary school	13	9.8	6	3.8	19	6.5		
	Beyond secondary	1	0.8	3	1.9	4	1.4		

*, ** means significant at the 5 and 10% levels respectively; F = Frequency.

77.2% were males while 22.8% were females. These results are slightly lower than the national statistics which indicated that female-headed households (FHHs) in Tanzania account for 25.0% of households nationally and for 24.0% in rural areas (FAO, 2014). This indicated that majority of crop farming households in the study area were headed by males. This is common in most African countries, where male farmers culturally dominate as the heads of families from the hierarchical pattern of family structure. This provides males the opportunity most times to embrace new innovations when they are introduced in the community more than their fellow female counterparts. It is argued by Tolera et al. (2014) that demanding advisory services on payment requires sufficient resources, such as land, livestock, etc., which female headed households usually lack. Comparison of sex distribution of respondents between the two districts did not indicate a significant difference (χ^2 = 1.187, ρ =0.276).

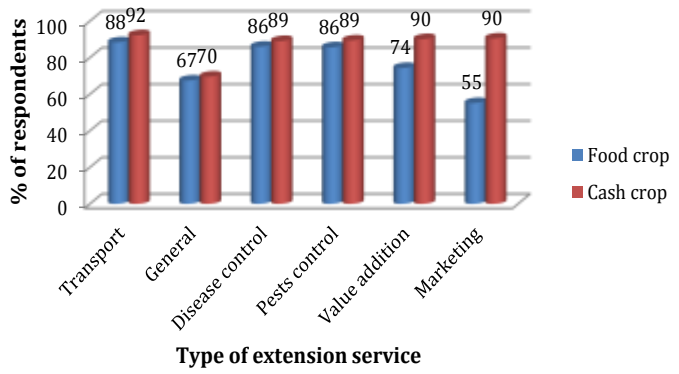

Figure 1. Percentage distribution of respondents by their WTP for AESs.

Respondents' age ranged between 21 and 75 years, with mean and standard deviation of 44.5 and 12.43 respectively indicating wide variation in the age of respondents. Findings reveal that a large proportion (about 70%) were 49 years old or less (Table 3). The higher percentage of young to middle-aged farmers showed that most farmers were still energetic to carry out the strenuous activities that accompany farm work in Tanzania where the hand hoe is still the dominant farming tool. Farmers' mean age of 44.5 years further attest to the fact that they were still active. Ogundele and Okoruwa (2006) asserted that only those farmers within the productive age group of 20-50 years are likely to possess the necessary strength to carry out farming operations. However, chi-square analysis revealed that age distribution of respondents slightly differed significantly between the two districts at 10% level of significance ($\chi^2 = 8.515$, $\rho = 0.074$).

Over two thirds (76.0%) of respondents were married, 10.3% divorced, 7.9% unmarried, and 5.8% were widowed. Distribution of respondents by marital status varied significantly between the two districts at 5% level of significance ($\chi^2 = 10.315$, $\rho = 0.016$). The findings show that there were more married respondents in Mpwapwa (82.4%) than in Mvomero (68.4%) and more widowed respondents in Mvomero (9.8%) than in Mpwapwa (2.5%). Marital status determines an individual's decision to demonstrate a mark of social responsibility and also indicates a readily available source of labour input (Adah et al., 2016). Adegeye and Dittoh (1985) declared that small-scale farmers could only be successful if they were married especially when they had to rely on family labour.

With regard to education, the findings show that majority of respondents (93%) had formal education and therefore probably were able to read and write, an attribute that enables them to understand issues and therefore can make informed decisions including a decision regarding paying for extension services (Sebadieta et al., 2007). Tolera et al. (2014) suggest that farmers who learned more may need farm specific information to manage their farm effectively on fee-for-service basis rather than confining themselves to general public goods.

Crop farmers' willingness to pay for agricultural extension services and the amount they are willing to pay

Willingness to pay for AESs

Of the 292 respondents, 88.0% were willing to pay for AESs associated with food crop production while 92.0% were willing to pay for AESs associated with cash crop (Figure 1 and Table 4). These findings are in line with other studies conducted in different parts of the world. Ackah-Nyamike (2003), for example, in a similar study conducted in Ghana reported that 82.0% of farmers were willing to pay for extension services while a study by Ozor et al. (2007) reporting that 80.6% of farmers in Nigeria were positively disposed to cost sharing in Nigeria.

However, these findings differ from some other studies. For example, in a study conducted in the three states of India, Sulaiman and Sadamate (2000) found that about 48.0% of farmers expressed a WTP for agricultural information. In Zimbabwe, Foti et al. (2007) found that only 4.6% of farmers were willing to pay for extension service, and 95.4% of the farmers were not. Ali et al. (2008) in Iran reported that only 24.7% of farmers were willing to pay for extension services and 75.3% were not willing to pay. Similarly, Francis et al. (2010) indicated that in Uganda, 35.0 and 40.0% were willing to pay extension services related to crops and animal husbandry respectively. These findings show that the willingness to pay for AESs was higher for crop farmers in Tanzania compared to their fellow counterparts in these other countries. This could be attributed to various strategies and initiatives taken by the government to improve the agricultural sector for the recent years.

Considering the six items that were assessed, although the difference might not be significant, findings show that more farmers were willing to pay for advice on value addition and marketing as compared with other items (Figure 1). Also, farmers are more willing to pay for services targeting cash crop than food crop indicating that farmers attach more value to cash crops than they do to food crops. This demonstrates that there is a conceptual change among the farmers from production orientation to market orientation. This sends a signal for AESs to cover the whole agricultural value chain. These findings are congruent with what is suggested by Chapman and Tripp (2003) that an important issue for the future of privatized extension is an understanding of exactly what type of service is to be provided. The authors add that no matter what the future of privatized extension, it is widely acknowledged that the traditional model of top-down, uniform instruction on crop

Table 4. Respondents' stated WTP amount (Tanzanian Shillings-TAS).

Parameter	Type/category of extension service											
	Extension agent's transport costs		General agronomic practices		Diseases control		Pests control		Crop value addition		Marketing of crops	
Type of crop	Food	Cash	Food	Cash	Food	Cash	Food	Cash	Food	Cash	Food	Cash
Frequency	258	261	197	197	251	252	250	253	217	255	161	256
Percent	88.4	92.2	67.5	69.6	86.0	89.0	85.6	89.4	74.3	90.1	55.1	90.5
Mean (×100)	34.22	34.08	35.43	33.45	37.31	36.98	37.90	38.21	35.52	42.92	34.88	45.82
Minimum	1000	1000	1000	1500	1000	1000	1000	1000	1000	1500	1000	2000
Maximum (×100)	60	60	100	100	150	150	150	150	100	100	200	200
SD × 100	13.30	12.92	21.14	17.01	25.39	23.22	26.34	25.30	19.80	27.21	26.02	30.60

N = 292 (food crop) and 283 (cash crop); SD = Standard deviation.

management recommendations (characteristic of much public extension) is far from the requirements of today's farmers.

Amount crop farmers are willing to pay

The willing respondents were also asked to state the amount of money they would be willing to pay for AESs (Table 4). The cost for AES was estimated per visit made by the extension agent. Zero was not considered as the amount but rather as an indication of unwillingness to pay hence not included in the computations. On average, farmers are willing to pay between 3422 and 4582 Tanzanian Shillings (TAS) per visit by extension agent for each of the six items associated with AESs. These findings reveal that farmers attach a certain value to extension service and at least are willing to pay something for the service. It is important therefore for extension administrators in Tanzania to actually estimate the total cost of providing extension service and then reconcile it with the amount farmers are willing to pay as revealed in this study in order to come out with a meaningful, achievable and sustainable figure prior to the introduction of a full-scale cost-sharing approach as a government policy.

Factors influencing crop farmers' WTP for AESs

WTP was regressed against a set of independent variables as indicated in Table 3. A Tobit regression model was estimated using STATA 12 computer programme. Robustness test results (Table 4) for the Tobit model revealed that the log-likelihood value (-246.62492), the pseudo R^2 (0.0559), and the chi-square value (28.95) were significant at $P \leq 0.0003$. The smaller p-value from the Likelihood Ratio (LR) test would lead us to conclude that at least one of the regression coefficients in the model is not equal to zero.

Seven out of ten factors were found significantly influencing farmers' WTP (Table 5). They include age of household head ($p \leq 0.034$), formal education attainment ($p \leq 0.039$), farming experience ($p \leq 0.001$), distance from farm to the nearest important road ($p \leq 0.000$), total household income ($p \leq 0.002$), commercialization of crop enterprise ($p \leq 0.037$) and attitude towards AESs ($p \leq 0.003$). Age was found to have a negative association with farmers' WTP for AESs which means that as the farmer grows older, his/her WTP for AESs decreases. These results conform to other studies (Gautam, 2000; Mezgebo et al., 2013). It is believed that older people prefer to keep tradition and therefore they are less likely to support the idea of paying for innovation. The implication of this is that if change is not required then there is no need for improved extension services and therefore no need to pay for it.

Findings (Table 5) show a positive association between attendance to formal education and WTP. These findings are according to what was hypothesized and are consistent with other studies (Ulimwengu and Sanyal, 2011; Ajayi, 2016). It is assumed that an educated farmer knows the importance of AESs hence should be more willing to pay than the uneducated one. Likewise, Tolera et al. (2014) argues that educated farmers may need farm-specific information to manage their farms effectively on fee-for-service rather than confining themselves to general public free goods.

Farming experience was positively associated with WTP for AESs, indicating that WTP increases

Table 5. The maximum likelihood estimates of the Tobit model.

Variable	Coefficient	Standard error	t	p>|t|
Age	-0.009526	0.003540	-2.69	0.034**
Sex	-0.04597	0.152584	-0.30	0.763
Education	0.462554	0.1907644	2.06	0.039**
HHSize	0.015322	0.018974	0.81	0.420
Landsize	0.003833	0.004318	0.89	0.375
FarmExp	0.024759	0.007225	3.43	0.001*
Distance	-0.657281	0.172043	-3.82	0.000*
HHIncome	0.45201	0.142917	3.16	0.002*
ComCrop	0.401422	0.160132	2.51	0.037**
Attitude	0.500259	0.166638	3.00	0.003*
_cons	1.421772	0.339317	4.19	0.000
/sigma	0.7786914	0.068409		
Model chi-square value	40.09			
Log likelihood	-246.625			
Prob>Chi^2	0.000			
Pseudo R^2	0.0559			

*,** Significant at 1 and 5%.

with farming experience. These findings contradict Tolera et al. (2014) who reported that the average years of farm experience were 21.9 and 28.6 for the willing and non-willing respondents respectively. Possible explanation for this could be that experienced farmers have accumulated more knowledge that they would not be ready to spend their money for something they already know. Our study did not predict a priori the direction of relationships between experience in growing crops and WTP because farming experience can have different effects to the farmer's decision to pay for AESs.

Willingness to pay was negatively associated with distance from farm to nearest important road. This is consistent with Francis et al. (2010) and Mwaura et al. (2010) who reported that WTP for AESs was less for those residing furthest from the main road. Possible explanation for this could be that farmers find it more expensive to cover transport costs for extension agent as he or she visits distant farm than it is for the near farm.

Income was positively associated with WTP meaning that household's WTP for AESs increased with total annual income. These findings are in line with prior expectation and consistent with many other studies (Tolera et al., 2014; Temesgen and Tola, 2015; Ajayi, 2016; Aydogdu, 2017). Possible explanation for this could be that more income means that a farmer has more funds to spend and can decide to experiment with the idea of sharing the cost of extension delivery. Also, available income for the household is expected to reduce household's poverty and thus increase its ability to pay for AESs. On the other hand, poverty reduces a household's willingness and ability to invest in agricultural technologies (Holden and Shiferaw, 2002).

Degree of commercialization for crop enterprise and attitude towards AESs were both positively associated with an increased probability of WTP. This implies that farmers are more willing to pay for extension if they derive greater benefits from the services. Umali and Schwartz (1994) argue that demand for agricultural extension services depends upon the expected net benefits from investment in new information. This also means crop farmers' WTP for AESs increases as their attitudes towards AESs changes from unfavourable to favourable state. The person's attitude towards an item is important in determining a person's intentions to or not to purchase the item (Ajzen and Fishbein, 1980). Findings further show that sex, household size and land size are not among the factors that influence crop farmers' WTP for AESs.

CONCLUSION AND RECOMMENDATIONS

This paper assessed the factors that influence crop farmers' WTP for AESs in Mpwapwa and Mvomero Districts. It concludes that farmers are willing to pay for AESs and their willingness is positively influenced by education, farming experience, income and attitude towards AESs and negatively influenced by age and distance to the nearest important road. Therefore designing of initiatives for paying for extension service for sustaining the AESs should pay attention to these factors. Farmers' WTP for extension service therefore is an indication that the introduction of fee-for-service AESs is feasible in Tanzania, especially in the study area.

The study recommends that: the government through

AESs should design and implement an effective adult education program in order to increase the farmers' level of education; and through TARURA should ensure rehabilitation of rural roads especially feeder roads that connect crop farms to the main roads. It addition, the government in partnership with other stakeholders should design programmes that are targeted at increasing the farmers' household incomes so that they can pay for extension services; through AESs, it should work on improving service delivery in order to ensure farmers' positive attitude AESs.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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