

WILLINGNESS TO PAY FOR AGRICULTURAL INPUTS BY CROP FARMERS IN ONA ARA LOCAL GOVERNMENT OYO STATE

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Abstract

This research work was designed to determine the willingness of farmer to pay for agricultural inputs. It describes the socio-economic characteristics of the respondents in the study area and to identify the inputs used in farm operations and ascertain problems encountered in the purchase of farm inputs. This study employed a multi-stage sampling technique. The research was carried out in Ona Ara Local Government Area of Oyo State. The total number of 90 respondents were sampled from selected wards. The results show that a change in the price of input affected the willingness to pay and that respondents were willing to pay more if the increase in the price of input affected the price of their final product. In addition, it was discovered that they were willing to pay more if the use of such inputs would reduce their stress and such inputs will be delivered to them. The Tobit model revealed that out of the Nine potential regressors seven were statistically significant, two of which had no economic significance. Such factors must be well considered in policy formulation for effective and efficient service delivery. It is therefore safe to conclude that a change in price has an effect on the willingness to pay for an increase in the price of inputs.

Keywords: Willingness; agricultural; Inputs.

Introduction

The value of goods and services is measured based on the importance of the goods and services for consumers and their preferences and choices. Consumer preferences are evaluated by the amount they are willing to pay for the goods or services. Thus, the Willingness to Pay (WTP) for goods or services is defined as the maximum price people are willing to pay for goods or services Wertenbroch and Skiera, (2002).

Agricultural inputs are defined as products permitted for use in organic farming. These agricultural inputs range from improved seeds, fertilizers and crop protection chemicals to machinery, irrigation and knowledge. Seeds are critical to successful crop production and inevitably, farm productivity and profitability. Fertilizer supplies nutrients to the soil that are essential for growth. These agricultural inputs range from improved seeds, fertilizers and crop protection chemicals to machinery, irrigation and knowledge. Willingness To Pay (WTP) is usually defined as the maximum amount that an individual would be willing to pay for a good or service without losing their utility. Farmers' WTP may depend on many interrelated factors, such as socio-economic and demographic characteristics, access to market and

infrastructure, quality of available inputs, and individual risk preference.

For agriculture to prosper, farm inputs need to be available, affordable, accessible, and good quality. Seeds, fertilizers, and agro-chemicals, are essential for improving the productivity and incomes of smallholder farmers in developing countries (World Bank, 2007, 2013; 2001; AGRA 2013; FAO, 2013). As input supply is a critical factor in inclusive agricultural and rural development, many donors support initiatives that improve smallholders' access to inputs. Some of these programs are successful, others are not.

The backbone of any agricultural revolution is access of farmers to modern agricultural inputs. Increased use of fertilizer and improved seeds are partially credited with the large increases in agricultural productivity growth in Asia during the Green Revolution in the 1960s. Irrigation is also essential for growth as it enables off-season farming, provides the potential for multiple harvests per year, and brings additional land under cultivation. Crop protection chemicals (pesticides, herbicides, insecticides and fungicides) control weed species, harmful insects and plant diseases that afflict crops. Finally, technical knowledge and machinery enhance human labor effectiveness and increase farm productivity. In 2012

study carried out by the Department of Agricultural Economics, University of Ibadan, on rice farming populations in the three major rice growing regions in Nigeria, showed that in one farming season, the adoption of improved agricultural inputs and technology to rice farming, gave farmers a 358.89kg/ha (approximately 9%) advantage over their peers who neither adopted improved inputs nor technology into farming processes ("Impact of Improved Agricultural Technology Adoption on Sustainable Rice Productivity and Rural Farmers' Welfare in Nigeria" AFDB, 2012). In the case of cassava, of which Nigeria is the world's largest producer, current production costs could be reduced by up to 40.5% with the usage of improved varieties of stems and the mechanization of planting and harvesting ("Cassava Demand: A Perspective" IITA, 2014). Applied with the ultimate goal of maximizing agricultural productivity, agricultural inputs definitely have a huge potential to scale up and unlock agricultural productivity in Nigeria. Many studies (including Dorward, 2009; Dorward & Chirwa, 2014; and Mason et al., 2013) observe that subsidy programs are very costly and they present heavy burdens on government budgets. This presents the need to trim down the government allocation to subsidies to reduce government deficits in a move to achieve fiscal discipline. The best way to do this is to gauge the average maximum that farmers are willing to pay for the farm inputs and charge that, in order to achieve equilibrium for both the government and farmers. Prices of subsidized inputs are typically pre-fixed by administrators based on the total budget allocation without employing quantitative methodologies. This may lead to economic inefficiency by causing a discrepancy between farmers' WTP and the prevailing prices of subsidized inputs.

To this end, a quantitative willingness-to-pay study is needed for pricing of farm inputs in order to ensure that the government can only contribute the minimum amount that people would wish the authorities to contribute. Such information will help the government, planners and policy makers to know the maximum amount to spend to subsidize the farm inputs while justifying the achievement of the intended objectives, that is, food self-sufficiency and poverty alleviation.

A major barrier to agricultural technology adoption in sub-Saharan Africa is the low quality of many agricultural inputs, coupled with a lack of reliable information on input quality. Demonstration plots across Africa have shown that modern agricultural inputs like improved seeds and fertilizer have the potential to improve yields. However, in practice, the prevalence of poor quality or counterfeit seeds and

other inputs in the market can make it inadvisable for small-scale farmers to take the risk of purchasing inputs that promise higher yields. Information gaps play a critical role in these input market inefficiencies. In recent years, many research-for development projects have been promoting improved seeds and fertilizers for agricultural intensification. An important question in this regard is the extent to which farmers are willing to pay for these technologies. As a result of inadequate use of agricultural inputs and to fill in the gap of food insecurity, the research is intended to close the gap and to find out the extent to which farmers are willing to pay additional price if the input is made available. This research intends to examine the willingness to pay for farm input by farmers in Ona Ara Local Government of Oyo State. The following research questions will be examined to (i) identify the extent to which farmers are willing and ready to pay for agricultural inputs (ii) What are socio economic characteristics of the respondents the study area (iii) What is the input that affect farmers performance? (iv) What are the problems encountered in purchasing farm inputs. These research questions will answer below objectives as to (i) the extent to which farmers are willing and ready to pay for agricultural inputs (ii) describe the socio-economic characteristics of the respondents, (iii) identify the input used in farm operation and (iv) ascertain problems encountered in purchase of farm inputs

Methodology

This study employed a multi-stage sampling technique. The 10 wards of Ona Ara Local government were selected and represent 10% of the sample frame. Primary data were obtained with the aid of structured questionnaire on farmers' socio-economic characteristics. While secondary information were obtained through the literature review. The socioeconomic data such as age, marital status, educational level, gender, farming experience, farm size, household size and the institutional factors such as access to credit, access to extension information, membership of association, extension contact, constraints faced by the farmers and maize output were sought from the respondents. The data collected was subjected to Descriptive statistics, and Multiple Regressions were used and attitudinal test (Likert scale) rated in five points was utilized. The response options ranged from "strongly satisfied" = 5; "satisfied" = 4, "indifferent" = 3, "not satisfied" = 2, "strongly not satisfied" = 1. The values were added to obtain 15, which was divided by 5 to get a mean score of 3.00. Mean scores of 3.00 or above was classified to be willing to pay

for agriculture input while scores less than 3.00 was regarded otherwise.

Model specification

The underlying assumptions behind this model are normality of the error term and identical valuation functions behind both the initial and follow-up answers. Cameron and Quiggin (1994) pointed out that the identical valuation functions assumption may fail in the case of initial bid price bias in the responses. In our case, the random selection of the initial bid prices rendered the valuation functions identical.

Among the covariates, household-specific characteristics, as well as access to market and infrastructure, served as key determinants of household demand for new technologies. We included individual risk aversion as an additional explanatory variable because, as discussed in the introduction, this factor has long been recognized as a WTP constraint and barrier to technology adoption. Also, the omission of risk preferences could bias the coefficient estimates of other covariates, such as education and wealth, which could potentially be correlated with individual risk preference. Since individual risk aversion is associated with barrier to technology adoption, its assume that WTP was expected to be negative, given that farmers in low-income settings are mostly uninsured. Households' wealth, education, awareness, and market access were all expected to be positively correlated.

Where, Y = Response of farmers on the willingness to pay for change in price of farm input.

X₁=Age (years) X₂=Gender (male or female)

X₃=Marital status (Single; divorced, widowed) or Married X₄ = Education (Level of schooling-years)

X₅=Household size (number of persons)

X₆= Farming experience (Years) X₇=Membership to association (Number of years) X₈=Extension contact (Number of times) u = Error term b₁ – b₈= Regression coefficients b₀ = Constant

Presentation and discussion of results

The result of socio-economic characteristics of the respondents are presented below shows that majority of the respondent in the study area are male 59.6%. This is in line with the work of Igbaroola and Oladuni (2012) which implies that men are more involved in farming activities than female. The mean age of the farmers is 47 years which implies that most of the farmers in the study area are in their active age, this support the research work of Girei et al:2016 who felt like the youths have an apathy for the agriculture. The level of education of the respondents indicated that majority are educated with larger number claimed to have tertiary education certificate Education been pivot to development must have responsible for adoption of new innovation injecting into farming activities. The mean of household is 4 which reveals that majority of the respondents has family setting. The size of the farm is a function of willingness to pay for inputs, result shows majority are medium scale farmers

Table 1 Socio- Characteristics of the Respondents

Variables	Frequency	Percentage	Mean
Sex			
Male	53	59.6	
Female	36	40.4	
Age			
20 – 25	5	5.62	46.57
26 – 30	11	12.36	
31 – 35	9	10.11	
36 – 40	10	11.24	
41 – 45	7	7.87	
46 – 50	14	15.73	
> 50	33	37.10	
Household Size			
1 – 3	40	44.94	3.80
4 – 6	46	51.68	
7 – 9	3	3.36	
Educational Level			
Non – Formal	12	13.5	
Primary	23	25.8	
Secondary	20	22.5	



Tertiary	30	33.7
Others	4	4.50
Marital Status		
Single	15	16.9
Married	62	69.7
Widow	7	7.9
Separated	3	3.4
Others	1	1.1
Farm size		
>1ha	20	18
2-3ha	50	45
>3	20	18

Source: Field Survey, 2021.

Willingness of Farmers to pay for additional cost per unit of input in farm production

Table 2 below shows the willingness of farmers to pay for additional cost per unit of input in farm production. It was seen according to the weighted mean scores that majority of them are willing to pay if the change in price of agricultural input affects the pricing of the

farm output, the mean score of 96.6 was recorded which makes it ranked 1st on the table, the mean score of 94.3, 93.6 were recorded for willingness to pay for higher improved input and willingness to pay higher for inputs if they can be delivered to them on farm respectively.

Table2 Willingness of Farmers to pay for additional cost per unit of input in farm production

S/N	Variable	SA	A	U	D	SD	WMS	RANK
1.	Change in price of agricultural input affects the pricing of the farm output	38(42.7)	44(49.4)	4(4.1)	5 (5.6)	2 (2.2)	96.6	1
2.	Will you pay higher if inputs can be made available at when needed	10(11.2)	63(70.8)	7(7.9)	5(5.6)	4(4.5)	58.6	5
3.	Will you pay higher for improved inputs	18(20.2)	42(47.3)	12(13.5)	12(13.5)	5 (5.6)	94.3	2
4.	Will you pay higher for inputs if the original inputs can be supplied	11(12.4)	19(21.3)	4(4.5)	46(51.7)	9(10.1)	40.6	6
5.	Will you pay higher for inputs if it can be delivered to you on farm	15(16.9)	54(60.7)	8(9.0)	7(7.9)	5 (5.6)	93.6	3
6.	Will pay higher for input if it will reduce the stress you go through during production (eg. Chemical Weeding, instead of Manual weeding)	16(18.0)	55(61.8)	13(14.6)	3(3.4)	2 (2.2)	57.43	4

Source: Field survey, 2021

Problems faced by farmers during production year

Table 3 shows problems facing farmers in production season, among the prominent one are price instability 35 (39.3%) and Scarcity of Input 46 (51.7%) were all mild problem while Cost of goods transportation (56.2%) were severe problems. Other noticeable severe problems was unavailability of input (44.92%).

Table 3: The problems faced by farmers during production year

S/N	Problems	Mild	Severe	Not a Problem
1.	Price instability	35 (39.3)	46 (51.7)	6 (6.7)
2.	Scarcity of Input	22 (24.7)	50 (56.2)	16 (18.0)
3.	Ineffectiveness of input	19 (21.3)	45 (50.6)	24 (27.0)
4.	Unavailability of input	32 (36.0)	40 (44.9)	15 (16.9)
5.	Unaffordability of Input	24 (27.0)	42 (47.2)	22 (24.7)
6.	Cultural biasness	22 (24.7)	39 (43.8)	26 (29.2)
7.	Cost of Defective Input	25 (28.1)	42 (47.2)	20 (22.5)
8.	Storage cost	23 (25.8)	46 (51.7)	19 (21.3)
9.	Cost of goods transportation	23 (25.8)	50 (56.2)	14 (15.7)
10.	Instability in Cost of labor	27 (30.3)	47 (52.8)	12 (13.5)

*Number in parenthesis represents percentage

Marginal effects of the explanatory variables on the dependent

The results in table 4 below shows that despite being statistically significant, all incomes have a very small impact on WTP and are thus economically insignificant, while illness costs have no significance at all. A one-year increase in age of household head is found to result in about a 0.775 bags increase in desired WTP, a result depicting economic significance. There are however declining returns to age for WTP as can be seen in the negative coefficient of the square of age such that WTP increases with age at a declining rate. Conditional on WTP being positive and all variables being at their mean values, an additional year in the age of household head is estimated to increase WTP by about 0.767. Therefore older household heads are more likely to be willing to pay for the farm inputs compared to younger heads. The result also shows that for each additional year in age of

the household head, the probability of WTP for subsidised farm inputs increases by 1.1%. This result is at par with our *a priori* expectations and a similar result was obtained by Maganga et al (2014) who estimated the determinants of jatropha adoption by peasants farmers. Conditional on WTP being positive, ownership of a radio at mean values of all variables is estimated to increase expected WTP by about 2.21 bags..

In addition, it was discovered that they were will to pay if the use of such inputs will reduce their stress, or if such inputs are delivered to them. Marginal effects of the explanatory variables on dependent variable This result is similar to the results by Maonga et al (2015), Oladele (2008) and Hagos et al (2012).

In summary, the results in this study reveal that WTP for subsidised farm inputs is a function of many factors in study area

Table 4: Marginal Effects of the Explanatory Variables on the Dependent

Variables Y	Change in Latent Y $\frac{\partial \partial[EE(yv xx)]}{\partial \partial xi}$	Change At means $\frac{\partial \partial[EE(yv xx,yy>0)]}{\partial \partial xi}$	Change in Probability $\frac{\partial \partial[PP(yv>0 xx)]}{\partial \partial xi}$
Age of H/H Head	0.7752636*** (0.0844363)	0.7571398*** (0.0811773)	0.0111327*** (0.0018359)
Age Squared	-0.0082329*** (0.000926)	-0.0080297*** (0.0009009)	-0.0001168*** (0.0000195)
Sex of H/H Head	5.166269*** (0.34828 6)	4.825429*** (0.3029703)	0.1609398*** (0.0198197)
Male			
Farm Size		1.850364*** (0.1173106)	
Education of H/H	1.894079*** (0.1177463)	1.607898*** (0.2758209)	0.0268524*** (0.0029406)
On-Farm Income	-		0.0159621*** (0.0027581)
Off-Farm Income	0.0000286*** (0.000014)	-0.000028** (0.0000136)	-
	-		0.000000406** (0.000000201)
	0.0000786*** (0.00000259)	-	
		0.00000767*** (0.00000254)	
	-0.0003385 (.0002055)		-
			0.000000111*** (0.0000000365)

Note: * denotes significance at 10% (i.e. $p < 0.10$); ** at 5% (i.e. $p < 0.05$); *** at 1% (i.e. $p < 0.01$). In parentheses are Robust Standard errors

Conclusion

In summary, the results in this study reveal that WTP for subsidized farm inputs is a function of many factors in Ona Ara Local Government Area of Oyo State. Age, sex and primary education for the household head as well as farm size, food security and radio ownership have positive and significant effects on WTP, whereas farm incomes and coupon receipt have a negative impact on WTP. Given all farmer characteristics the descriptive statistics showed that the maximum number of bags that some farmers would pay was 70 if fertilizer sold at MK 1000. The Tobit model revealed that out of the twelve potential regressors ten were statistically significant, two of which had no economic significance. Such factors must be well considered in policy formulation for effective and efficient service delivery. The first seemingly important and significant factor across models is income or financial means. A price payment schedule for the soil testing should be designed in such way that farmers are able to afford it, given that the study reveals high-income farmers or those with access to financial resources are willing and able to pay more for the inputs services.

It is therefore safe to conclude that change in price has an effects on the willingness to pay for increased in price of inputs. Sequel to the conclusion above it is therefore recommended that government should make inputs available to potential farmers since they are willing to pay for the service.

Recommendations

One major issue to be solved before designing any pricing policy is to inform farmers about the importance of price subsidy for increasing their yields. The investigation suggests that farmers are not well informed or educated on the need for other parameter benefits.. In addition, NGOs and development projects working with farmers should include a training module to explain benefits to farmers to raise awareness.

This result suggests that encouraging risk reduction options, such as agricultural insurance, could be one policy recommendation for boosting farmers' willingness and demand for improved agricultural technologies.

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