DETERMINANTSOFFARMERS' WILLINGNESS TO PARTICIPATE IN SORGHUM VALUE CHAIN INNOVATION PLATFORMS: CASE OF AGRICULTURAL TRANSFORMATION AGENDA SUPPORT PROGRAM PHASE-1

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ABSTRACT
This paper tends to examine the determinants of farmers' willingness to participate in value chain innovation platformsand ascertain the factors influencing their willingness to invest in adopting improved technologies in the value chain. Structured questionnaire was used to elicit response from 235 sorghum farmers registered under the program in Kano and Niger states. Responses were analysed using the Probit regression analysis and multiple regression analysis. The result showed that for any increase in age of the farmers, they were 43% less likely to be willing to participate in VCIPs. It was also shown that for an increase number of the farmers' household members in active labour force, they were 20% more likely to be willing to participate, while for an increase in the farmers' access to Extension services and improved technologies, they were 142% more likely to be willing to participate; an increase in the amounts farmers were willing to invest to adopt improve technologies, increases likelihood to be willing to participate in VCIPs. It showed that the factors that influence farmers 'decision to invest to adopt improved technologies included: age, their Income from the value chain activities and the number of trainings they received. It follows that younger farmers were more willing to participate in VCIPs but were less willing to make all their investment in one value chain. They were adventurous; tend to diversify their investment into other ventures but the older farmers, who were willing to participate, tended to be willing to invest more in one value chain.
Keywords: Determinants, Innovation Platform, Value chain, Willingness

INTRODUCTION

In Nigeria, just like in every other African country, there have been policy shift, over the decades, from investing in the establishment of National Agricultural Research Systems (NARS), to a two-step system of having a NARS complemented by a state run agricultural extension delivery system, to current thinking that a pluralistic, private sector driven space could provide the most effective and sustainable means for mainstreaming science and technology in agriculture. (Chema*et al.*, 2003)

Innovation platforms involve stakeholders joining to find novel ways of solving problems by combining indigenous knowledge, business interests and organization skills. The stakeholders interact to jointly identify problems and opportunities, seek and apply solutions, learn, reflect and source more solutions for the innovation process to continue (Adekunle *et al.*, 2010). Markelova *et al.* (2009) noted that the approaches and practices that encompass the full range of activities and services of market actors required to bring a product or service from its conception to its end use and beyond is termed a value chain. The value chain concept entails the addition of value as the product progresses from input suppliers, to producers and consumers. The emphasis is on the relationships between networks of input suppliers, producers, traders, processors, and distributors (UNCTAD, 2000).

The Federal Government of Nigeria (FGN) in the effort to attract private sector investment in agriculture, reduce post-harvest losses, add value to local agricultural produce, develop rural infrastructure and enhance access of farmers and other value chain actors to financial services and markets through the Federal Ministry of Agriculture and Rural Development (FMARD) in collaboration with the African Development Bank with developed the Agricultural Transformation Agenda Support Program Phase-1 (ATASP-1), which is funded by the African Development Bank (AfDB). The Agricultural Transformation Agenda Support Programme Phase-1 (ATASP-1) is utilizing the Value Chain Innovation Platform approach to bring different value chain players together, to be able to solve their problems within their capacity.

The objective of this paper is to examine the determinants of farmers' willingness to participate in value chain innovation platforms and ascertain the factors influencing their willingness decision considering the amount they are willing to invest in adopting improved technologies in the value chain.

METHODOLOGY

Study area - The Agricultural Transformation Agenda Support Program Phase-1 in Nigeriaas a pilot project focusing on three commodities (Rice, Cassava and Sorghum) is run based on the Staple Crop Processing Zone

arrangement (SCPZ) and operated in four SCPZs. Kano and Niger States being two of the States sampled from two of the SCPZ was the study.

Niger state with a population of 3.9 million people (Alamu, 2013), is classified as one of the largest states in the country spanning over 86,000 km^2 in land area with 80% of the land mass conducive for agriculture (Tologbonse, 2008); lies on latitude 80° to 11°:30' North and Longitude 03° 30' to 07° 40' East. Niger state with 9.30% of the total land area of the country experiences distinct dry and wet seasons with annual rain fall varying from 1,100mm in the northern parts to 1,600mm in the southern parts. In the same vain, the total land area of Kano State is about 20,760sq km (RDDK,2009). The total population in 2006 national census is about 9,386820 people (NPC, 2009); Kano State is located in the tropics, a region characterised by alternating wet and dry conditions, with annual rainfall of 850mm occurring between April/May and September/October with peak in July and August.

The population of the study consisted of the ATASP-1 registered sorghum farmers in Kano and Niger States. The sample size consisted of 235 registered ATASP-1 Sorghum farmers in both States. Multistage sampling procedure was used for the study. Primary data was used for this study, derived using a well-structured questionnaire and interview schedule to collected data from sampled farmers. This study used inferential statistics suchProbit regression model and Multiple regression modelwere used. The Probit regression model attempted to capture factors determining willingness decision which is a participation equation and the marginal effects of the significant variables were determined and Multiple linear regression was used to determine the relationship between these factors and amount the farmers are willing to contribute to adopt the sorghum technologies being promoted in the Value Chain Innovation Platform.

RESULTS AND DISCUSSION

The result in Table 1 shows that the variables that were significant to determine the farmers' willingness to participate in sorghum VCIPs included age (0.008, p≤0.01), number of household members in active labour force (0.029, p≤0.05), access to extension services and improved technologies (0.000, p≤0.01) and amount farmers are willing to invest to adopt sorghum (0.005, p≤0.01).The result shows that as the farmers' age increases; they are 43% less likely to be willing to participate in sorghum VCIPs than the younger farmers. This result agrees with Asante *et al.* (2011), whose study showed a negative relationship between age and farmers' participation in microcredit programmes in northern Ghana.

It also shows that as the farmers' household members in active labour force increases; they are 20% more likely to be willing to participate in sorghum VCIPs. Number household members in active labour force have great implications to agriculture and can increase farmers' willingness to participate in sorghum VCIPs. Also, as the farmers' access to Extension services and improved technologies increases; they are 142% more likely to be willing to participate in sorghum VCIPs than the younger farmers and as the amounts farmers were willing to invest to adopt improve sorghum technologies increases, they are 0.0015% more likely to be willing to participate in sorghum VCIPs.

Table 1: Determinants of farmer's willingness to participate in Sorghum VCIPs

Willingness to participate	β - value	Std. Err.	p-value	Marginal Effect
Age	-.0429346	.0160938	0.008***	-.0001642
Level of Education	-.3027757	.2096451	0.149	
Household in family Labour	.1979173	.0905079	0.029**	.0007568
Annual Income	-7.16e-07	5.97e-07	0.230	
Income from Sorghum	1.13e-06	3.05e-06	0.711	
Number of training	.105791	.0650366	0.104	
Access to Extension	1.420579	.4075397	0.000***	.0359547
Amount willing for Sorghum	.0000149	5.35e-06	0.005***	5.69e-08
Marital Status	-.6043639	.5696483	0.289	
Market access	-1.690267	1.043837	0.105	
Cons	3.533785	1.514248	0.020**	
Number of observations	235	Prob> chi2	0.0000	
Log likelihood =	-34.351648	Pseudo R2	0.4978	

*** Significant at 1%** Significant at 5%

Considering the factors influencing willingness decision of farmers' participation, the result in Table 2 showed that the socio-economic variables were significant to influence farmers' willingness decision in relation to the amount farmers are willing to invest to adopt improve sorghum technologies included age, farmer's income from sorghum value chain sources and

number of trainings attended by farmers. The result shows that for any increase in age, there is a probability of farmers to be more willing to increase their investment in sorghum technologies by N1722 even though age of the farmers have a positive relationship with the amount farmers are willing to invest to adopt improve sorghum technologies. This implies that though the age of the farmers is negatively related to the probability of willingness to participate in sorghum VCIPs, it has an adverse relationship with amount farmers are willing to invest to adopt improve sorghum technologies. This means that the younger sorghum farmers are more willing to participate in sorghum VCIPs but are less willing to do all their investment in sorghum value chain alone since they are adventurous and tend to diversify their investment in trying many other ventures but the older sorghum farmers who are willing to participate tend to be willing to invest more or all in sorghum technologies.The result also shows that for any increase in farmers income from sorghum value chain source by N1, there is a probability of farmers to be more willing to increase their investment in sorghum technologies by 41 kobo implying that increase in farmers' income from sorghum value chain sources will result to an increase in the amount farmers are willing to invest to adopt improve sorghum technologies. The result also shows that for any single increase in number of trainings attended by farmers, there is a probability of farmers to be more willing to increase their investment in sorghum technologies by N10,051 implying that an increase in number of trainings attended by farmers will result to an increase in the amount farmers are willing to invest to adopt improve sorghum technologies

Table 2: Factors influencing willingness decision to participate in Sorghum VCIPs

Amount willing to invest	Coef.	Std. Err.	P>|z|
Age	1722.673	822.0808	0.037**
Level of Education	-3568.578	10684.64	0.739
Household in family Labour	-3034.165	2643.499	0.252
Annual Income	.0238149	.0184269	0.198
Income from Sorghum	.4088953	.0711006	0.000***
Number of training	10051.87	2221.551	0.000***
Access to Extension	-1676.02	27352.23	0.951
Marital Status	-16846.05	25493.93	0.509
Market access	58683.32	39377.7	0.138
Cons	-66111.88	66766.27	0.323
Number of observations	= 235	R-squared	= 0.4907
Log likelihood	= 0.0000	Adj R-squared	= 0.4704

*** Significant at 1%** Significant at 5%, ** Significant at 10%

CONCLUSION

The results showed that the determinants of farmers willingness to participate included age, number of household members in active labour force, farmers' access to Extension, and the amount farmers are willing to invest to adopt the technologies deployed in the programme. The factors influencing their willingness decision to participate considering the amount farmers are willing to invest to adopt the technologies deployed in the programme were their age, income from sorghum value chain sources, and the number of trainings they received.The recommendations of the study are that, there is increased need:

i. For further education of the farmers on the benefits of the platforms after the awareness campaigns.
ii. For development of cheap and cost effective simple farm tools that the farmers can afford to effectively help them mechanise the production processes and avoid discontinuation of technologies after adoption.
iii. To create the enabling environment for other value chain actors to fully participate in the innovation platforms especially the financial institutions so that there can be full appreciation of each other by them and the farmers.

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