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*Full Length Research Paper*

# Sociocultural implications on innovation adoption: the case of adoption of yam minisett technology among farmers in Northern Region, Ghana

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**This paper discussed findings of a survey conducted to investigate the implications of cultural believes and practices associated with yam farming on the adoption of Yam Minisett Technology among farmers in the Nanumba North and Gushiegu Districts of Northern Region of Ghana. Data were collected from a sample of 180 farmers, 90 from each district and analysed using discriminant analysis and the results presented in tables. The results of the study revealed that, among the variables which were found to be significant in predicting farmers' adoption behaviour regarding Yam Minisett Technology, the sociocultural considerations such performance of rituals associated with yam growing contributed strongly in the total discriminant power of the independent variables in the discriminant function. Others cultural beliefs and practices related variables which were significant in classifying adopters of Yam Minisett Technology and Non-adopters were 'believe or otherwise of spiritual nature of yam crop' and 'adherence or otherwise of cultural taboos associated with yam cultivation'. This paper therefore recommends that extension field officers should take into account cultural believes and practices concerning yam production and adopt appropriate behaviour change communication strategies in disseminating and promoting adoption of improved technologies among yam farmers.**

**Keywords:** Yam minisett technology, discriminant analysis, adopters and non-adopters

## INTRODUCTION

Yam is predominantly produced and consumed in West Africa, with Nigeria being the largest producer and Ghana the leading exporter of the commodity (Aidoo, Ohene-Yankyera, Marfo and Blaise, 2009) brings in foreign exchange for the country development and providing job and income along the yam value chain. As the leading exporter of yam in the world, yam exports contribute significant foreign exchange earnings to the Ghanaian economy (Ohene-Yankyera, Aidoo and Ohenewa-Tawiah, 2011). Yam have long been a major staple food eaten in different forms as fufu, boiled, fried, and roasted for millions of people not only in the major producing areas but elsewhere in the world (IITA/EIARD, 2013). In Ghana, yam is an important source of carbohydrate among the roost and tubers, next to cassava, and constituting about 13% of household food budget in urban centres (Aidoo et al., 2009) and is used as raw materials for starch industries and pharmaceutical companies (Amanze, Agbo, Eke- Okoro and Njoku, 2011). Average daily consumption of yam is about 300kcal per capita (FAO, 2013) making it the third most important energy source in Ghanaian diet, and accounting for 20% of the country's total calories intake.

Availability and cost of planting material (seed yam) have been and continue to be major constraints to large scale yam production require in order to take advantage of increasing domestic and foreign demand of yam. The problem of inadequate supply of planting material or seed yam had bedevilled yam production for a long time now. For instance, two decades ago Tetteh and Saakwa, (1994) as well as Degas (1993), in their study identified inadequate supply of planting material, which is almost entirely vegetatively propagated by planting pieces of the tuber or setts, as main constraints facing yam farmers in increasing the production of the commodity. Yam planting materials are derived from the edible portion, which is expensive (50% of production cost), bulky to transport, and has a low multiplication ratio (less than

1:10) in the field (Oguntade, Thompson and Ige, 2010).

In order to solve the problem of unavailability of planting material 'Yam Minisett

Technology' (YMT) was developed in the 1970s and had since been shown to be a cost-effective way for yam farmers to grow their own seed yam and plant more yams than traditional methods (Oguntade et al., 2010). Minisetts are small pieces of tuber (25-50g) which, if treated appropriately can be planted at relatively high density and will produce small tubers (up to about 400g) which are ideal to use as seed yams the following season for establishing a ware crop (large tubers sold for food). Under YMT, minisetts are dusted with a pesticide and wood ash mixture and planted into a nursery for sprouting, before being transplanted onto the field (IITA/EIARD, 2013).

**Problem statement**

In recent times, in 2010, a baseline survey conducted by College of Agriculture and Natural Resource of the Kwame Nkrumah University of Science and Technology, observed that as an important food and export crop in Ghana, yam has been the focus of a number of research activities in the areas of breeding, agronomy, soil management, pathology, entomology, postharvest management as well as demand and consumption. All these are aimed at enhancing the potential of the crop to reduce household food insecurity and alleviate poverty among producers, processors and traders.

Also adoption studies on the uptake of these various research production recommendations have been undertaken in various ecological zones of Ghana. For instance Otoo, et al. (2008) studied the promotion of Yam Minisett Technology among farmers in Ghana, Acheampong, et al., (2008) and Otoo, Anchirina, Ennin, and. Asiedu (2008) both examined sustainable yam production and farmers willingness to adopt non-staking option of yam production among Ghanaian farmers. Also IITA/ELARD, (2013) observed a low rates of adoption of Yam Minisett Technology and cited a number of reasons, including a high degree of risk, with the small size of minisetts making them vulnerable when planted in the field and other socioeconomic characteristics of farmers, inspite of effort made by Ministry of Food and Agriculture through the Roots and Tubers Improvement and Marketing Programme (RTIMP) to promote the adoption of these technologies to boast yam production in Ghana.

Although many adoption and diffusion researchers (see for example Rogers, 1962; Rogers and Shoemaker, 1971; Robertson, 1971; Katz et al., 1963 and Zaltman, 1965), have long recognize the importance of cultural influences upon the diffusion and adoption processes, very few attempts have been presented by way of empirical evidence how prospective adopters' cultural beliefs and practice influence their adoption decision. Culture have been widely acknowledged as an important variable in predicting people behaviours (Ajzen, 1991), but there is still difficulties understanding how it works in influencing people adoption decision. Evidence available seems to suggest that, generally, social scientists seem to have been more interested in the role of innovations as elements of cultural change than in the impact of culture upon the diffusion and adoption processes (see Flight, D'Souza, 2011; Barnett, et al., 2005 and Tan and Boon, 2002). In other words, the main stream of interest has been the influence of innovation upon culture rather than the influence of culture upon innovation adoption and diffusion process.

However, Haverkort and Milla, (1992) observed that in adjusting to changing conditions, farmers experiment in ways which sometimes includes spiritual aspects. These aspects are often unperceived or even ridiculed by outsiders, but they are very much a reality for insiders. Farmers cosmovision regarding how they view, perceive and relate to their natural environment shape their farming practices, and how they undertake indigenous experimentation (Millar, 1999) and how they will response to externally generated scientific knowledge and innovation.

Yam is one important crop which has so many beliefs and cultural practices assigned to it by farmers in West Africa where it is predominantly cultivated. A study by Ukachukwu on 'The Sacred Festival of Iri Ji Ohuru in Igbo land, Nigeria reveals the divine origin and the sacred nature of yams in the traditional belief of the Igbo people in Nigeria (Ukachukwu, 2007).

Many ethnic groups in places where yam is widely cultivated celebrate New Yam festivals to mark the beginning of new yam season. Such festivals are widely celebrated in Ghana and Nigeria (see Gbedegbe, 2013; NACD, 2008 and Ukachukwu, 2007). Because of the cultural significant of yam and the fact that some farmers view yam cultivation not only as merely growing crops for food and income but also a means of performing traditional rites and cultural practices. Tuzin, (1972) observed that yams are thought to be a religious plant with spirits inherent in them. Also Ishii, (1992) noted that yam cultivation goes beyond agriculture and economic consideration but have cultural and religious symbolic among rural farmers in many part of the world. This findings still reflects contemporarily farming systems and cosmovision in northern Ghana, as observed by pellow, (2011), that farmers in northern Ghana still viewed farming as a way of life and a means of relating to the environment and drawing sustenance from it by engaging in shifting cultivation to produce food mainly for household consumption. Also more recent findings by Siera, (2013) observed that production of food and its distribution are reflected in the social norms, values and families roles that structure the way Dagomba people in particular and northern Ghana in general, live.

Therefore any study design to examine factors influencing the adoption of technology in yam production

in general and the adoption of Yam Minisett Technology in particular needs to consider sociocultural beliefs and practices of farmers relating to yam production. However many studies on the adoption of Yam Minisett Technology failed to consider cultural beliefs and practices of farmers relating to yam production. Most of the adoption studies on Yam Minisett Technology do not go beyond socioeconomic, profitability, soil and agronomic factors. As such information relating to farmers' beliefs and practices associated with yam production do not find adequate expression in available literature and could lead to policy makers and implementers failing to consider this important cultural variable in promoting the adoption of Yam Minisett Technology to help boost yam production in the country. This current paper presents findings of a study on the sociocultural implications of adoption of Yam Minisett Technology among farmers in the Nanumba North and Gushiegu Districts of Northern Region of Ghana.

## RESEARCH METHODOLOGY

Data for this paper was obtained from a survey of yam farmers in Nanumba North and Gushiegu Districts of the Northern Region of Ghana. The two Districts are located in the Eastern Corridors of Northern Ghana with conducive climates and soil characteristics suitable for a wide range of crops production including yam which constitute the dominant crop in the area. According MOFA (2010), the soils in the Eastern corridor of Northern Region are the savannah ochrosols Savannah Glysols and the ground water laterite. Which are heavy and dark colored, medium size textured, moderately drained soils suitable for a wide range of crops.

From the list of yam farmers in the two districts obtained from the District offices of Ministry of Food and Agriculture (MOFA), a random sample of 100 farmers each from the two Districts were selected with a target sample size of 200 yam farmers. However, during the field survey in Decembers, 2013 to collect data, some of the sampled farmers could not be contacted for interview and some of the filled questionnaires were incomplete, reducing the actual sample size for the study to 180 yam famers (representing 90% of the initially targeted sample size). Also key informer interviews were conducted among experience and knowledgeable farmers in order to understand sociocultural issues round yam farming among the three major ethnic groups in the study area. The three major ethnic groups in the two districts are the Dagombas, Nanumbas and Komkonbas.

### Data analysis

A Discriminant Analysis (DA) was employed to determine factors that correctly classified adopters of Yam Minisett Technology from non-adopters. The dependent variable being examined here is a dichotomy independent variable, taking two variables form as adopters and non-adopters. Discriminant analysis which involves the determination of a linear equation like regression that will predict which group the case belongs to is the most appropriate analytical techniques. Discriminant analysis captures the relationship between multiple independent variables and a categorical dependent variable in the usual multivariate way, by forming a composite of the independent variables. Similar analysis was used in a study by Torben Hansen, (2005) in determining consumers' adoption of online grocery buying. Also Kisaka-Lwayo, (2007) use discriminant Analysis to identify factors associated with the Adoption of Certified Organic Farming by Smallholder Farmers in Kwazulu-Natal, South Africa.

The initial empirical model that was used as a discriminant function to test whether the selected factors correctly classified adopters and non-adopter was: $Di = \beta0 + \beta1Disti + \beta2AGE + \beta3YEDT + \beta4EXP + \beta5FASIZE + \beta6SOSYi + \beta7EASYi + \beta8LABSi + \beta9EXCT + \beta10RLIGi + \beta11RITUi + \beta12YSPCi + \beta13TABOi + \beta14OTHi + \beta15PROi + \mu$

Where Di = adoption category (i = 1 for adopter: i = 0 for otherwise), β = coefficients of independent variables as Dist = District ((i =1 for Gushiegu;i = 0 for Nanumba North)) AGE = Age of farmers in years; YEDT = Number of years in formal schooling completed, EXP = experience in farming yam in years, FASIZE = Farm size in acres, SOSYi = main source of yam seeds (i= 1 for previous harvest; i=0 otherwise), EASYi = Easiness of obtaining yam seeds (i=1 for yes is easy; i= 0 for otherwise), LABSi = source of labour (i=1 for family labour; i = o for otherwise), EXCT = Extension Contact, RLIGi = Religious background (i=1 for traditional; i= 0 for otherwise), RITUi = Do you perform rituals in growing yam (i=1 for yes; i=0 for otherwise), YSPCi = Do you observed yam production taboos (i=1 for yes; i=0 for otherwise), OTHi = Perception of other farmers adoption behaviour(i=1 for yes; i=0 for otherwise), PROi = Most pressing Problem (i=1for lack of planting materials; i=0 for otherwise)

## RESULTS AND DISCUSSIONS

Analysis of the study results, found high level of awareness among yam farmers in the two Districts about Yam Minisett Technology (YMT). Out of the 180 yam farmers interviewed, only 10 of them (representing 5.5%) were unaware of the YMT. However only 79 Farmers (representing 43.9%) have adopted the technology for producing their yam seeds and planting materials for their farms. The average length of time that respondents who adopted the YMT having been using it to generate their yam planting materials was found to be six (6) years, whilst the oldest to adopt have been practicing it for nine (9) years now, the latest to adopt were in their fourth (4) year of practice.

The explanatory variables which were examined to determine whether they significantly classified adopters

**Table 1:** Description and Mean Distribution of Variables

| Variables Descriptions | Adopters(n = 79) | | Non-Adopters (n= 91) | |
|---|---|---|---|---|
| | Mean | Std. Dev. | Mean | Std. Dev. |
| District ( 1 = Gushiegu District; 0 = Nanumba North) | 0.49 | 0.50 | 0.51 | 0.50 |
| Age (in years) | 35.87 | 7.46 | 44.53 | 6.67 |
| Number of Education (years of formal schooling) | 6.11 | 5.97 | 0.26 | 1.24 |
| Experience in Yam farming (years) | 9.75 | 6.14 | 23.93 | 5.94 |
| Farm Size (in acres) | 2.65 | 1.30 | 3.36 | 1.06 |
| Main Source of seed yam( 1 = previous harvest; 0 = otherwise) | 0.57 | 0.50 | 0.65 | 0.98 |
| Easiness of obtaining seed yam (1 = yes; 0 = otherwise) | 0.58 | 0.50 | 0.31 | 0.46 |
| Source of labour (1 = family labour; 0 = otherwise) | 0.48 | 0.50 | 0.37 | 0.49 |
| Extension contacts in the last season(Number of AEAs visit) | 3.87 | 1.54 | 1.36 | 1.79 |
| Religious background (1 = traditional; 0 = otherwise | 0.15 | 0.36 | 0.18 | 0.38 |
| Do you perform rituals in growing yam (1 = yes; 0= otherwise) | 0.15 | 0.36 | 0.82 | 0.38 |
| Do you believe that yam is a spiritual crop(1 = yes; 0= otherwise) | 0.13 | 0.33 | 0.89 | 0.31 |
| Do you observed yam production taboos (1 = yes; 0= otherwise) | 0.20 | 0.40 | 0.85 | 0.36 |
| Perception of other farmers adoption behaviour(1 = yes; 0= otherwise) | 0.77 | 0.42 | 0.26 | 0.44 |
| Most pressing Problem (1= lack of planting materials; 0 = otherwise ) | 0.68 | 0.47 | 0.51 | 0.50 |

Source: Analysis of Field survey Data, 2013

and non-adopters were selected based on literature on farmer attributes and sociocultural practices associated with yam production among yam farmers (see IITA/ELARD, 2013; Otoo, et al., 2008; Acheampong, et al., 2008 ; Ukachukwu, 2007 and Ishii, 1992). Table 1 presents the description and mean distribution of the selected variables.

As shown in the Table, respondents from both districts (Nanumba North and Gushiegu) were equally likely to either adopt the YMT or not with a mean of 0.49 (SD = 0.5) and 0.51 (0.5) respectively as adopters and non-adopters on the variable District (1 = Gushiegu District; 0 = Nanumba North District). The study revealed that young farmers are more likely to be adopters with a mean age of 35.87 years compare with non-adopters mean age of 44.53years. Also adopters were found generally to be better educated with a mean schooling years completed of 6.11 compare to 0.26 of average schooling years completed for the non-adopters category. However, contrarily to apriori expectation, adopters of Yam Minisett Technology were generally less experience in farming with a mean experience in yam farming of 9.75years which is far below the average experience of 23.93 for the non-adopters. This is so because young farmers were more likely to be adopter than older farmers, since people who have been doing something for a long time hardly want to change.

The average farm size of adopters and non-adopters were found to be 2.65acres and 3.36acres respectively. Indicating that farmers surveyed for this study, as a whole are smallholder farmers with a mean farm holding of less than 5acres. With non-adopters having relatively larger farm size than the adopters. Also both categories of farmers (adopters and non-adopters) mostly source their planting material (seeds yam) from their previous harvest using the conventional method in the case of non-adopters and the Minisett Technology as the case of adopters. As indicated in the Table 1, adopters average score and that of non-adopters on their main source of seed yam (1 = previous harvest; 0 = otherwise) were 0.57 and 0.65 respectively. Indicating that only minority of yam farmers in the study area usually obtained their yam seeds from the market or borrowed from friends and relatives but rather prepared their own planting material from their previous harvest. However, adopters were found more likely to indicate that it is less difficult to obtain their planting materials for their yam farms than non-adopters. Analysis of responses to the statement 'easiness of obtaining seed yam (1 = yes is easy; 0 = otherwise)' revealed that whilst adopters generally affirmed with a mean score of 0.58 that it is easy for them to obtain seed yam, the non-adopters viewed were to the contrarily with a mean score of 0.31. Contrarily to the notion that rural farmer generally depend on their family labour for their farm operations, yam farmers interviewed for this study slightly used more hire and communal labour for their yam farming activities such mounds rising, planting, weeding and harvesting than their family labour. As shown in Table 1, adopters and non-adopters average score on main source of labour (1= family labour; 0 = otherwise) were 0.48 and 0.37 respectively indicating that other sources of labour such as communal and hire labour are mostly used to drive the yam farming operations.

Findings of this study confirmed a widely held notion that farmers' access to extension services is imperative

in improving their adoption of innovation (see Acheampong, et al., 2008; Otoo, et al., 2008 and Asiedu 2008). Farmers' access to extension in this study was measured by number of extension agent visits within the last season. The mean extension agent visit for both adopters and non-adopters are presented in the Table 1. As shown in the Table, adopters received average extension visits of 3.87 as against only 1.36 mean extension agent visit by the non-adopters.

The study also examined respondents' perceptions and practices of certain sociocultural beliefs and practice associated with yam cultivation such as rituals and taboos to be performed and observed in yam farming activities. Most of the farmers interviewed were either Moslems or Christians with very few being followers of traditional religion. Analysis of respondents religious background (1 = traditional; 0 =otherwise) yielded mean scores of only 0.15 and 0.18 respectively for adopters and non-adopters. With regard to performance of rituals such as preparation of concoctions to be applied on yam seeds before planting, performing rituals or festivals to mark the beginning of yam harvesting season, adopters of YMT and non-adopters were sharply divided. Analysis of response to the question 'do you perform rituals in growing yam (1 = yes; 0 = otherwise)' demonstrates that adopters generally do not perform rituals in growing their yams having 0.15 mean score on the question compare with the mean score of 0.82 of non-adopters, indicating their general confirmation that they do perform rituals in growing their yams as part of their sociocultural beliefs and practices.

Similar observation was demonstrated from the analysis regarding farmers view about the spirituality of yam as it is commonly belief in many part of the world (see Ukachukwu, 2007 and Ishii, 1992). Adopters' average score base on the analysis of their response to the question 'do you believe that yam is a spiritual crop (1 = yes; 0 = otherwise)' was 0.13 compare with that of non-adopters of 0.89. This clearly shows that, whilst adopters were less likely to regard yam as spiritual crop, non-adopters were more likely to regard it as such. Also findings from three key informers; one from each major ethnic groups in the two district, interviewed as part of data collection for this study, it was gathered that, as a spiritual crops there exist certain taboos expected to be observed by farmers in particular and rural folks in general. Some of the mentioned taboos included 'menstruating women are not to enter a yam field as they will defy the sanctity of the field' 'new yam should not be harvested or eaten until the rituals or community festivals are perform by the chief priest or head of clan or family' 'one should not appoint his left finger at yam filed nor enter other farmers yam field without their approval'. Analysis of response gathered from farmers interviewed, on the question 'do you observed yam production taboos (1 =yes; 0 = otherwise)', also shows whilst non-adopters were strong adherence to the observance of taboos associated with yam production (with average score of 0.82), adopters with a mean score of 0.2 hardly observed these taboos.

Available literature indicates that individual perception about other people adoption behaviour influence their decision regarding adoption of the innovation (Ajzen, 2006 and Fishbein & Ajzen, 1975). As such respondents' perception about other farmers adoption of YMT were examined. Analysis of respondents perception of other farmers adoption behaviour (1 = yes adopting; 0 = otherwise) indicates that adopters with a mean score of 0.77 perceived other farmers to be adopting the technology in producing their yam planting material as against a mean score of 0.26 of the non-adopters, implying their perception were that other farmers are not adopting the technology.

Also farmers' perception about the urgency of an innovation and its relative advantage in solving their felt needs better, affects their adoption decision. The study show that farmers who considered unavailability of yam planting material as their most pressing problem were more likely to be adopters of YMT in a bit to overcoming the problem than those who considered other problems such as lack of market and good prices for their produce as their most pressing problem. As shown in the Table 1, adopters average score on the statement 'most pressing problem (1 = unavailability of planting material; 0 = otherwise) was 0.77 as against 0.51 for the non-adopters group. In all unavailability of yam planting materials is the most pressing problem of yam farmers in the Nanumba North and Gushiegu Districts, regardless whether they are adopters of YMT or not. This confirmed early studies by IITA/EIARD, (2013); Aidoo et al., (2009) and Amanze, et al., (2011).

**Discriminant analysis of adopters and non-adopters of YMT**

A discriminant analysis as a dichotomy multivariate statistical analytical technique used in identifying factors which correctly classified or discriminate a well grouped population, were applied to determine factors which correctly classified adopters and non-adopters of Yam Minisett Technology. Table 2 presents F –values with their corresponding degree of freedoms and significant levels of selected variables in the specified empirical model of the discriminant function. Out of the initial 15 variables used in stating the specified empirical discriminant function, four (4) variables as shown in the Table 2, were found not to be significant in discriminating or classifying the adopters and non-adopters group at both 5% and 10% significant levels. The variables are District of respondent, main source of labour, religious background of respondents and most pressing problem in yam production. As such they were not included in the discriminant function. Also gender of farmers as male and female were initially not included because almost all (but only 2) farmers interviewed were males. Yam

**Table 2:** F – Distribution of independent variables used in the discriminant function

| Variables | F | df1 | df2 | Sig. |
|---|---|---|---|---|
| District | 0.02 | 1 | 168 | 0.88* |
| Age | 63.87 | 1 | 168 | 0.00 |
| Number of Education | 83.34 | 1 | 168 | 0.00 |
| Experience in Yam farming | 233.86 | 1 | 168 | 0.00 |
| Farm Size | 15.70 | 1 | 168 | 0.00 |
| Main Source of seed yam | 119.02 | 1 | 168 | 0.00 |
| Easiness of obtaining seed yam | 13.88 | 1 | 168 | 0.00 |
| Source of labour | 2.00 | 1 | 168 | 0.16* |
| Extension contacts in the last season | 94.53 | 1 | 168 | 0.00 |
| Religious background | 0.17 | 1 | 168 | 0.68* |
| Do you perform rituals in growing yam | 137.43 | 1 | 168 | 0.00 |
| Do you believe that yam is a spiritual crop | 234.85 | 1 | 168 | 0.00 |
| Do you observed yam production taboos | 119.61 | 1 | 168 | 0.00 |
| Perception of other farmers adoption behaviour | 58.17 | 1 | 168 | 0.00 |
| Most pressing Problem Production | 5.65 | 1 | 168 | 0.20* |

Source: Analysis of field Data, 2013

* not a significant discriminant factor

farming is predominantly male farming enterprise because it's labour demand and sociocultural limitations (see Acheampong, et al., 2008; Otoo, et al., 2008 and Asiedu 2008).

## Coefficients of the discriminant function

From the discriminant analysis, eleven (11) variables were found to be significant in discriminating between the two groups (adopters and non-adopters) as shown in Table 3 With Wilks' Lambda statistics of 0.078 ($\chi 2$ = 409.219; df = 15 p = 0.00) indicates that the discriminating power not accounted for by the discriminant function is insignificant, while 80% of the variables correctly classified the two groups of adopters and non-adopters.

Also, with conical correlation of 0.853 yielding R-square (co-efficient of determination) of 0.728 implying that 72.8% of the variation among the dichotomy dependent variables as adopters and non-adopters is jointly explained by the variation of independent variables in the discriminant function. The variable 'do you perform rituals in growing yam' was significant in classifying adopters and non-adopters contributing the highest (23.3%) to the total discriminant power of the independent variables in the discriminant function. Farmers who do not perform rituals such as consulting oracles before planting yam, applying concoctions on yam seeds before planting among others characterised adopters whilst farmers who perform those rituals were more likely to belong to the non-adopters category. Believes in such traditional rituals influence farmers' acceptance of scientific technologies and that could explain this finding.

Education was the second most ranked variable which discriminates between adopters and non-adopters, contributing 16.5% to the total discriminant power of the selected independent variables. Many studies have demonstrated the influence of education on farmers' adoption of innovation (see Acheampong, et al., 2008; Otoo, et al., 2008 and Asiedu 2008) and have been noted to play critical role in improving adoption of best farming practices and innovation. This study further confirm those findings as years of formal schooling was found to be significant in farmers adoption behaviour of Yam Minisett Technology. Adopters mean schooling years was 6.1 years as against 0.3 years for non-adopters. Farm size contributed 13.2% to the total discriminant power with respondents with relatively larger farm size less likely to adopt the technology in generating their yam seeds. Age of farmers which was significant in discriminating between adopters and non-adopters contributing 12.3% to the total discriminant power of the independent variables in the discriminant function. Young farmers were more likely to be classified in the adopters' category than older ones. The mean age

**Table 3:** Coefficients of discriminant function

| Variables | Standardized Coefficients | Percentage Contribution | Unstandardized Coefficients |
|---|---|---|---|
| Age | 0.690 | 12.3 | 0.098 |
| Number of Education | -0.926 | 16.5 | -0.222 |
| Experience in Yam farming | 0.179 | 3.2 | 0.030 |
| Farm Size | 0.737 | 13.2 | 0.626 |
| Main Source of seed yam | -0.399 | 7.1 | -1.174 |
| Easiness of obtaining seed yam | 0.644 | 11.5 | 1.343 |
| Extension contacts in the last season | -0.299 | 5.3 | -0.178 |
| Do you perform rituals in growing yam | 1.307 | 23.3 | 3.505 |
| Do you believe that yam is a spiritual crop | 0.211 | 3.8 | 0.651 |
| Do you observed yam production taboos | 0.137 | 2.4 | 0.358 |
| Perception of other farmers adoption behaviour | -0.076 | 1.4 | -0.176 |
| Constant | | | -7.476 |

Percent of Correct Classification = 80%
Conical Correlation = 0.853
Wilks' Lambda = 0.078 ($\chi 2$ = 409.219; df = 15

Source: Analysis of Field Data, 2013

of adopter was 35.9years compare with average age of 44.5 years of that of non-adopters.

Easiness of obtaining yam seeds or otherwise, contributed 11.5% to the total discriminant power of the independent variables, significantly distinguished between adopters and non-adopters. Main source of seed yam as either from previous harvest or otherwise was significant in discriminating between adopters and non-adopters contributing about 7% of the joint discriminant power of the independent variables in the discriminant function. Extension contact was also significant in classifying adopters and non-adopters contributing 5.3% of the total discriminant power in the discriminant function.

Also farmers' view of the spiritual or otherwise of yam crop were significant in classifying the sampled population as adopters and non-adopters constituting 3.8% of the total discriminant power of the independent variables. Respondents' perception about other farmers' adoption behaviour towards the YMT and farmers adherent or otherwise of yam cultivation taboos were significant in categorizing adopters and non-adopters but they constitute only 1.4% and 2.4% of the total independent variables in the discriminant function respectively.

## CONCLUSION AND RECOMMENDATIONS

Notwithstanding the effort of Ministry of Food and Agriculture (MOFA) through the Roots and Tubers Improvement and Marketing Programme to promote the adoption of Yam Minisett Technology, this study revealed that even though there is overwhelming awareness among yam farmers about the technology but majority (53.5%) of the 170 respondents who knew about the technology have not adopted it. Among the variables which were found to be significant in predicting farmers' adoption behaviour regarding Yam Minisett Technology, the sociocultural considerations such performance of rituals associated with yam growing contributed strongly in the total discriminant power of the independent variables in the discriminant function. Others cultural beliefs and practices related variables which were significant in classifying adopters of Yam Minisett Technology and Non-adopters were 'believe or otherwise of spiritual nature of yam crop' and 'observant or otherwise of cultural taboos associated with yam cultivation'. Farmers who considered and adhered to these cultural believes and practices associated with yam production were generally non-adopters of the Minisett Technology whilst those who do not adhered to those believes and practices were more likely to adopt the technology.

Education, farm size and age were also found significant in predicting farmers' adoption behaviour. Respondents with more years of formal schooling were found more likely to be adopters of the technology than those with no formal educational background. Also the mean age of the adopters category was 35.9years as against 44.5years as average age of the non-adopters group. This implies that young farmers were more likely to be adopters than older farmers. However, adopters of the technology have smaller farm size compare of non-adopters.

It is therefore recommended to extension field officers to take into account cultural believes and practices concerning yam production in disseminating and

promoting adoption of improved technologies among yam farmers. Also behavioural change communication strategies should be adopted by extension practitioners to help change rural farmers attitude and mind set about their farming activities and how they perceive and relate to their crops and animals. Also non-formal education and literacy programmes should be encourage and supported by the Districts authorities and Farmer Based Organization to run literacy class among rural farmer to promote their understanding of scientific technology in order to enable them utilize those technologies for sustain improvement in agricultural productivity.

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