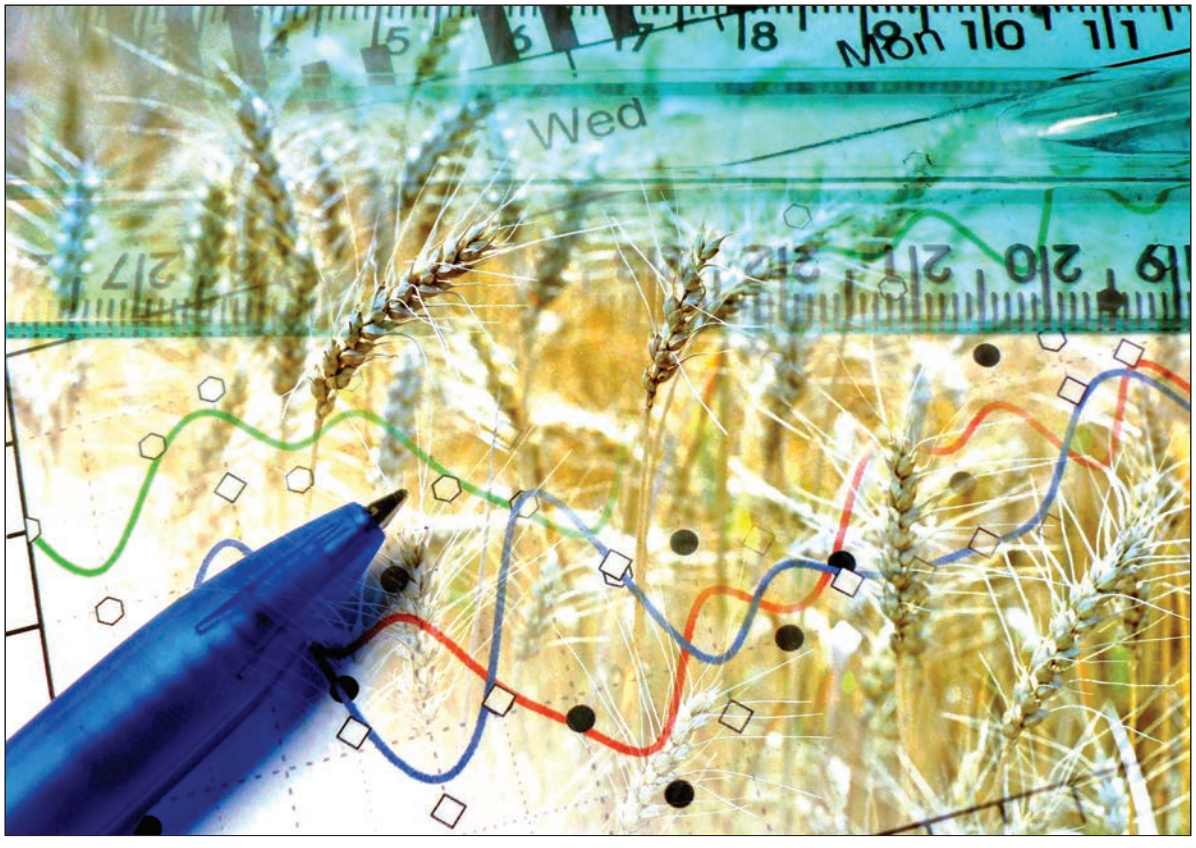

Trends in Agricultural Economics

ISSN 1994-7933

science alert

ANSInet
an open access publisher
http://ansinet.com

OPEN ACCESS Trends in Agricultural Economics

ISSN 1994-7933
DOI: 10.3923/tae.2016.21.28

Research Article
Influence of Trade Liberalization and its Related Policies on Skilled Labour Adoption in Yam Production in Ghana

M. Seidu

Department of Agricultural Economics, College of Agricultural, Chaudhary Charan Singh Haryana Agricultural University, Hisar, 125004, Haryana, India

Abstract
This study examines the levels of skilled and unskilled labour adoption and the influence of trade potential factors on the adoption of these labours in Kpandai district in Northern Ghana. The level of skilled labour and trade potential factors influencing its adoption remain inconclusive and unknown in the yam subsector. Empirical measure of the level of labour use among 510 sampled yam farm households revealed that skilled labour dominate (61.2%) yam production among farm households. Furthermore, this study estimated a logit model which identifies that trade factors that were important in explaining the likelihood of skilled labour use include producer price, competition among households, degree of market integration and cost of transportation. It is therefore recommended that policy should be directed in improving the income levels of skilled labours to ensure the effective maintenance and continuity of skilled labour use. Furthermore, the influential factors should be factored in policy formulation and implementation in order to promote skilled labour adoption in yam production.

Key words: Skilled labour, unskilled labour, adoption, yam, trade potential factors

Received: June 21, 2015 Accepted: September 14, 2015 Published: June 15, 2016

Citation: M. Seidu, 2016. Influence of trade liberalization and its related policies on skilled labour adoption in yam production in Ghana. Trends Agric. Econ., 9: 21-28.

Corresponding Author: M. Seidu, Department of Agricultural Economics, College of Agricultural, Chaudhary Charan Singh Haryana Agricultural University, Hisar, 125004, Haryana, India

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

The effect of trade liberalization and its related policies on unskilled and skilled labour often move in opposite directions, implying an ambiguous direction of change in employment in relation to the type of labour. Labours used in agricultural are mainly thought to be unskilled because the perception of many people is that labours in the sector has only fundamental knowledge in farming (Nisha, 2008). Moreover, it is believed that strong, energetic and physically built persons are considered good to be agricultural labours. The definition of labour by Srivastava (1993) is similar to the perception perceived by peoples in agriculture sector and outside. Srivastava (1993) defined agricultural labourer as one who is basically unskilled, unorganised and has little for his livelihood, other than personal labour. Likewise, Nisha (2008) described agricultural labourers, as generally unskilled workers carrying on agricultural operations in the old traditional ways. This study, therefore, defines skilled labour as special kind of labour employed by farm households for special operations (such as mounding, ploughing and weedicides application) who has adequate knowledge and technique in executing the operation. On the other hand unskilled labour in the study suggests labour that would not be considered for special operations where these special labours are available. Greenwood and Seshadri (2004) suggested that, agriculture hires unskilled workers while manufacturing employs skilled ones. The idea is that as agriculture expands relative to manufacturing, the demand for unskilled labour rises.

Yam is an extremely important staple crop vital to food security and socio-cultural needs in Ghana. The crop is produced both as a food and cash crop. The total production of the crop increased from 877,000 in 1990 to 66,40000 t in 2013 mainly by smallholder farmers (FAOSTAT., 2015). The crop accounted for 11% of total consumption in 2007 (Aidoo, 2009). The commodity contributes to 16% to the country's Agricultural Gross Domestic Product. It is not only significant to the domestic market but also to the export market. Ghana is the leading exporter of yam, accounting for over 94% of total yam exports in West Africa (Anaadumba, 2013; Osei-Assibey, 2015). Family labour used to be the main source of labour in yam production prior to the economic reform in 1983. However, a recent study conducted by Seidu (2013) revealed that hired labour is the main source of labour in yam production in the era of the post economic reform thus in the environment of trade liberalization and its related policies. Trade liberalisation and its related policies has increase the area under cultivation for yam production in Ghana (Marcotte and Al-Hassan, 2005; Seidu, 2013) therefore going by the assertion of Greenwood and Seshadri (2004), it suggested that the demand for unskilled labour should increase. However, what is obvious in the yam subsector is the intrusion of the labour markets by skilled workers though the level unknown. Bartel and Lichtenberg (1985) found that it is not the availability of labour, but rather how skilled the labour is that would be important in technology adoption. Therefore is unsurprising that, the inclusion of skilled workers in many sectors has over the past two decades kept on rising. The relative rise in the demand for skilled labour is because producers in various sectors have raised their skill intensity of production and not because skill-intensive sectors have gained employment shares at the expense of unskill-intensive sectors (Machin, 1996; Bernard and Jensen, 1997; Dunne *et al*., 1997; Osburn, 2001). The rise in demand for skilled labour has vindicated trade liberalisation policies: according to the neoclassical redistributional argument based on the Stolper-Samuelson theorem, trade liberalization is effective in making developed countries specialize in skilled labour use. However, comparing the assertions that have been underscored by the scholars above to developing economies of which Ghana cannot be ignored, it can be deduced that the rise in demand for skilled labour in developed economies might not be the same as that of the developing economies, but there have been some progress. This study captured trade liberalisation and its related policies as farm household characteristics that make households able to commit their produce to mostly international market and also meet the demands of trade liberalisation. The characteristics include farm household ability to address consumers complains, export, market integration, outlet of sales, market proximity, competition, producer price, time of marketing, farm size and distance and nature of road to the market (cost of transportation).

Considering the yam subsector of Ghana there has been numerous innovations at all stages of production which has affected the unskilled labour use in the subsector. The liberalisation of trade in Ghana has influence some yam producers to look at their production unit as a more business like entity where even mounding operations, ploughing, pesticides application and seed yam preparation are left for special (skilled) labourers to attend to. While the level of skilled and trade potential factors influencing its adoption remain inconclusive and unknown in the yam sector, in this study therefore objectives are to estimate the levels of adoption of skilled labour and identify trade potential factors affecting the adoption of skilled labour. Knowing the levels and trade potential factors affecting the use of skilled labours can invigorate means to promote the adoption of skilled labour in the yam production in Ghana.

METHODOLOGY

Theoretical model: The logit model was employed within the framework of this analysis (Field, 2000; Nnadi and Akwiwu, 2007; Greene, 2008; Maliki *et al*., 2009; Seidu, 2013, 2014). This model makes it possible to predict the decision to adopt skilled labour and not to adopt. Thus the decision to adopt lies between 0 and 1. The model also caters for the problem of heteroscedasticity. The model can be presented by the following formula Eq. 1 and 2:

$$E(y_i) = P(y_i) = \frac{1}{1+e^{-z}} \quad (1)$$

where, $P(y_i)$ is the probability for a household i for adopting skilled labour, $P(y_i) = 1$ if skilled labour is adopted and 0 otherwise, e is an exponential function.

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \varepsilon_i \quad (2)$$

where, β_0 is the intercept, β_1, β_2...β_n are the estimated coefficients of the corresponding variables X_1, X_1... X_n and X_1, X_2... X_n are independent variables specifying innovation Error term is represented by ε_i.

Empirical model of the study: The study was conducted in Kpandai district of Northern Ghana. Multistage sampling was employed in the study. The first and second stages were purposive selection of the region (Northern) and the district (Kpandai) because of their respective massive yam production relative to other regions and districts. Also, more than 50% of the farm households in the district are engage in yam production. The district consists of four major agricultural zones namely; Kpandai, Katiejieli, Jamboi and Ekumidi. In the third stage, the study included all the zones in the survey in order to get representative sample from each zone in the district. In the fourth stage, within each agricultural zone 4 communities were randomly sampled except Katiejieli where five communities were randomly sampled because the number of communities engaged in yam production in the zone was many relative to the other zones. The total number of communities that were sampled was 17. The random sampling technique was again employed in stage five to select 30 farm households within each selected community. In all 510 farm households were selected and interviewed using structured schedules. The data collected include skilled and unskilled labour use as well as characteristics of farm households towards trade liberalisation and its related policies. The data collected were analysed using both the descriptive statistics such as mean, percentage, frequency distribution and standard deviation. The binary logit regression analysis was used. The model used is implicitly presented as in Eq. 3 and 4:

$$Y = f(X, I, C, O, D, Q, P, T, S, R) \quad (3)$$

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 I_i + \beta_3 C_i + \beta_4 O_i + \beta_5 D_i + \beta_6 Q_i + \beta_7 P_i + \beta_8 T_i + \beta_9 S_i + \beta_{10} R_i + \varepsilon_i \quad (4)$$

Where:

$$Y_i = \begin{cases} 1 \text{ if household used special (skilled) labour to handle special (skilled) operations} \\ 0 \text{ if household used otherwise to handle special (skilled) operations} \end{cases}$$

Export (X), Market integration (I), Consumers complains (C), Outlet of sales (O), Market proximity (D), Competition (Q), Producer price (P), Time of marketing (T), Farm size (S), Cost of transportation (R_i), Intercept (β_0), Estimated parameters ($\beta_{1...10}$), Error term (ε_i).

The farm household characteristics defining trade liberalization and its related policies included in the specified model in Eq. 3 and 4 were presented in Table 1. Table 1 also shows brief description of the variables, its measurement and the a prior expectations of the variables.

RESULTS AND DISCUSSION

Description of farm household based on trade potential characteristics

Producer price: As indicated in Table 2 producer price of yam of the sample respondents ranged from GH¢ 0.50-4 for a tuber of yam while that of a "Batch of yam" was GH¢ 50-400. The mean selling price of a group of 100 tubers of yam (batch of yam) of the sample household was GH¢ 141.63 with standard deviation of 57.80.

Degree of Integration into market economy: It can be depicted that from Table 2, the total number of yam sold by sample households vary from 100-75000 tubers. Moreover, the average degree of integration of sampled farmers into the market economy was 13721 (76.01%) tubers of yam with a standard deviation of 13067 (15.96).

Export: Furthermore, the quantity of yam exported by sampled households ranges from 0 (0%)-20000 (70.18%) tubers with mean of 1404 (7.50%) and a standard deviation of 3056 (13.6%).

Table 1: Description of variables used in the Empirical model

Variables	Definition and measurement of variables	Hypotheses
Export (X_i)	Quantity of direct sales to export agents and/or to middle men who also sell to export agents	+
Market integration (I_i)	Quantity of yam sold in the production season	+
Consumers complaints (C_i)	Ability and willingness to address consumer complains. 1, if Yes and 0 otherwise	+
Outlet of sales (O_i)		
Farm gate (O_f),	Quantity of yam sold at farm gate	+
Village market (O_v)	Quantity of yam sold at village market	-
Urban market (O_u)	Quantity of yam sold at urban market	+
Market proximity		
Urban market (D_i)	The time (hours) taken to transport yam from the farm to the urban market using lorry	-
Competition (Q_i)	Number of yam suppliers in the area	+
Producer price (P_i)	The average price of hundred tubers if yam	+
Farm size (S_i)	The acreage of yam farm under cultivation	+/-
Time of marketing		
Sales before market season (T_b)	Quantity of yam tubers sold before market season	+
Sales during market season (T_d)	Quantity of yam tubers sold during market season	+/-
Sales after market season (T_a)	Quantity of yam tubers sold after market season	+
Producer price (Pi)	The selling price of hundred tubers of yam	+
Cost of transport (R_i)	The average cost of transporting hundred tubers of yam	-

Source: Author's construction

Table 2: Distribution of farm households according to trade potential characteristics

Trade potential characteristics	Mean	SD	Min.	Max.
Producer price of yam				
A tuber of yam (GH¢)	1.39	0.59	0.5	4
A batch of yam (100 tubers of yam) (GH¢)	141.63	57.80	50	400
Market integration				
Tubers of yam sold (No. of tubers)	13721	13067	100	75000
Tubers of yam sold (%)	76.01	15.96	10.26	100
Quantity of yam for export				
Total yam exported (No. of tubers)	1404	3056	0	20000
Total yam exported (%)	7.5	13.26	0	70.18
Outlet of sales				
Tubers of yam sold at farm gate	3353	7548	0	53000
Tubers of yam sold at farm gate (%)	16.03	25.73	0	100
Tubers of yam sold at village market	1216	2567	0	19000
Tubers of yam sold at village market (%)	16.45	29.88	0	100
Tubers of yam sold at urban market	9154	8747	0	50000
Tubers of yam sold at urban market (%)	67.52	33.45	0	100
Competition among yam suppliers	10.00	6.00	1	40
Time of marketing				
Tubers of yam sold before market season	1922	5376	0	52000
Tubers of yam sold before market season (%)	10.40	19.84	0	100
Tubers of yam sold during market season	8090	7652	0	48500
Tubers of yam sold during market season (%)	67.19	35.66	0	100
Tubers of yam sold after market season	3715	7544	0	47200
Tubers of yam sold after market season (%)	22.42	32.41	0	100
Cost of transportation	27.46	6.94	17	45

Source: Generated from field survey data, Min: Minimum, Max: Maximum

Addressing consumers complaints: Among the sampled households, 493 (96.67%) of them received complaints on their produce nonetheless only 274 (53.73%) of them were willing and have the ability to address the needs and complaints of customers (Table 3).

Outlet of sales: The quantity of yam sold at the farm gate ranges from 0-53000 tubers, with a mean number of tubers of 3353 (16.03%) and a standard deviation of 7548 (25.73). Likewise, the quantity of yam sold at village markets ranges from zero to 19000 tubers, with an average number of tubers of 1216 (16.45%) and a standard deviation of 2567 (29.88). Similarly, the number of yam sold at urban markets varies from 0-50000 tubers, with an average number of tubers of 9154 (67.52%) and a standard deviation of 8747 (33.45).

Table 3: Distribution of households in relation to consumers/customer complaints

Handling consumer complaints	Frequency	% (N = 510)
Households that received/heard complaints on the quality of yam	493	96.67
Households with the ability and are willing to address complaints	274	53.73

Source: Generated from field survey data

Table 4: Distribution of labour technologies by adoption levels

Type of labour	Frequency	% (N = 510)
Skilled	312	61.2
Unskilled	198	38.8

Source: Generated from field survey data

Table 5: Multicollinearity test result for continuous variables (N = 510)

	Collinearity statistics		
Variables	VIF	Tolerance	R^2
Producer price	1.47	0.6806	0.3194
Farm size	1.38	0.7268	0.2732
Market proximity (urban)	1.29	0.7731	0.2269
Sales during main market season	1.29	0.7744	0.2256
Competition among producers	1.54	0.6488	0.3512
Sales at farm gate	1.43	0.7009	0.2991
Sales at the village market	1.47	0.6797	0.3203
Export	1.26	0.7964	0.2036
Integration into market economy	1.35	0.7380	0.2620
Cost of transportation	1.28	0.7817	0.2183

Source: Computed from field survey data, VIF: Variance inflation factor

Market proximity: Farmers that sold their produce in the urban market spent between 10-26 h on roads with an average time of 17 h and standard deviation of 4.78.

Competition among yam farm households: It was observed from Table 2, that, competition among farmers' ranges from 1-40 farmers with mean competition of 10 farmers and a standard deviation of 6. The impression deduced was that for every farmer in the study area there were 10 farmers surrounding him or her that were equally involved in the supply of yam. This put a lot of pressure on a farmer to produce to meet the needs and specifications of consumers in order not to lose customers to the other 10 farmers.

Time of marketing: In Table 2, the quantity of yam sold before the main market season varies from 0-52000 tubers, with a mean number of tubers of 1922 (10.40%) and a standard deviation of 5376 (19.84). Similarly, the quantity of yam sold during the main market season ranges from 0-48500 tubers, with an average number of tubers of 8090 (67.19%) and a standard deviation of 7652 (35.66). What's more, the number of yam sold after the main market season varies from 0-57400 tubers, with an average number of tubers of 3715 (22.42%) and a standard deviation of 7544 (32.41). Households selling their produce before and after the main market season constitute farmers selling in the lean season.

Cost of transportation: As shown in Table 2, the cost of transporting a "Batch of yam" ranged from GH¢ 17.00-45.00 with an average cost of transportation of GH¢ 27.46 and a standard deviation of 6.94. It is worthy to note that the cost transportation is a function of yam size.

Level of skilled and unskilled labour use: Changing over, the phase of the result and discussion to the type of labour it was observed that farmers employed special kind of labours for pecial operations (such as mounding, ploughing and weedicides) application. The study considered these labours as skilled. From the Table 4 it was observed that 61.2% of the sampled farmers employed skilled labour for special or skilled operations and 38.8% of the farmers use strictly unskilled labours for all farming activities.

Trade potential factors affecting skilled labour: A multicollinearity test was run prior to the logit regression modeling. Variance Inflation Factor (VIF) was used for testing the association between the hypothesized continuous variables. The problem of multicollinearity was avoided by excluding the variables with high VIF value equal or greater than 10. Therefore, variables that showed high VIF value more than 10 were dropped. Moreover, predictors not significant and does not have the expected sign were dropped from the models. The VIF values depicted in Table 5 show that all the

Table 6: Determinants of skilled labour adoption

	Skilled labour		
Variables	Log odds	Odd ratio	Margin
Producer price	0.005**	1.005**	0.001**
	(0.020)	(0.020)	(0.018)
Addressing complaints (yes)	0.124	1.132	0.022
	(0.666)	(0.666)	(0.666)
Farm size	0.004	1.004	0.001
	(0.623)	(0.623)	(0.623)
Time of marketing (during)	-0.000	1.000	-0.000
	(0.915)	(0.915)	(0.915)
Competition	0.143***	1.153***	0.025***
	(0.000)	(0.000)	(0.000)
Outlet of sales (village market)	0.003	1.003	0.000
	(0.521)	(0.521)	(0.520)
Export	0.004	1.004	0.001
	(0.661)	(0.661)	(0.661)
Market integration	0.012*	1.012*	0.002*
	(0.106)	(0.106)	(0.102)
Transportation cost	-0.039*	0.961*	-0.007*
	(0.058)	(0.058)	(0.055)
Constant	-1.480	0.228	
	(0.119)	(0.119)	
Observations	510	510	510
Degree of freedom	9	9	
Log likelihood	-269.879	-269.879	
Mc Fadden R^2	0.208	0.208	
LR test	141.552***	141.552***	
Classification	70.20%	70.20%	

*,**,***Signification at 10, 5 and 1%, respectively, p-values for t-test in brackets are shown below the coefficients, Source: Computed from field survey data

continuous explanatory variables considered in the model have no serious multicollinearity problem.

The logit regression model in Table 6 provides the overall results of the adoption skilled labour. Goodness-of-fit measures indicate that the model was highly significant at $p<0.01$ with a likelihood ratio chi-square of 141.552, Log likelihood value of -269.879 and a Mc Fadden R^2 of 0.208. The model correctly predicts 70.20% of the observations. Table 6 also indicates that four variables were important in explaining the adoption of skilled labour: producer price, competition and market integration have a positive significant influence on skilled labour adoption however, the cost of transportation has an inverse effect.

Producer price: The coefficient for the variable representing the producer price has a positive sign in the regression model. This indicates that producers that receive high prices for their produce were more likely to innovate (thus employing skilled labour) compared to those that receive low selling price. Specifically from Table 6, farmers that receive GH¢ 1.00 increase in the prices of their produce were likely to employ skilled labour by 0.1%. Moreover, not only was the coefficient positive but also statistically significant at 5% level. The result also confirms the conclusion made by Thiele (2002) and Stephanie (2007). In a different study they all concluded that producer prices positively influence innovation adoption. Farmers receiving high prices for their produce have extra motivation in terms of their household income. The bloated income earned (because of high producer price) in the sales of yam probably enables these households to hire the services of skilled labour.

Competition: Competition was statistically significant ($p<0.01$) in influencing the likelihood of farmers to use skilled labours. The sign of the coefficient (positive) was also in agreement with the apriori expectation. This means that farmers that were surrounded by more other yam farmers use skilled labours compare to farmers that were surrounded by few other yam farmers. Going strictly by the results in Table 6 it was observed that, a one-person increase in the competitors increases the log odds of not staking yam farm by 0.792 (which is a 20.8% increase in likelihood of skilled labour). More yam farm households (competitors), in a surrounding deepen the rivalry among farmers. Therefore high intense competitive pressure dominates among households. Producers now pay close attention to each other competitive strategy. Thus, once a household starts using a skilled labour other households in the same surrounding also tries to follow suit in order to prevent a neighbour (competitor) from gaining monopolistic power in terms of market share than they do. The results agree

with the finding of Guadalupe (2007) who identified that market competition in the manufacturing sector increase the use of skilled labour and were rewarded more (in relative terms) as competition increases.

Integration into the market economy: The factor, market integration influences the adoption of skilled labour positively at a significant level of 10%. The relation recorded indicates that one percent increase in the sales of yam increases the log odds of hiring skilled labour by 0.012 (which is a 0.2% increase in the likelihood of adopting skilled labour). Employing the services of skilled labour require a high financial demand which means that household with low financial background cannot hire the services of skilled labours. The result was in consistent with the assertion of USDA (2010) that movement towards more food integrated markets raises the justification of the adoption of more profitable technologies. Therefore, households integrating more of their produce to the market were likely to earn higher income levels and were in better positions to pay for the services of skilled labours (profitable technology) than subsistence household would do.

Cost of transportation: Similar to study of the adoption of hire labour by Seidu (2013), where the sign of the cost of transportation was negative, the same effect was observed in skilled labour adoption. However, the significance level was 10% in this case. From Table 6 it was observed that, a GH¢ 1.00 spent on output, transportation cost decreases the probability of employing the services of skilled labour by 0.7%. The rationale behind this relation was quiet understandable because households spending much on transportation (because of bigger size of tubers) have less to save to effectively employ and pay for the services of skilled labours. Similar to the assertion of McQuaid *et al.* (2004), the negative relation between the cost of transportation and skilled labour adoption can be explained that good transport networks can increase the supply of skilled labour in an area directly through easier access to the farm localities and also through increasing the attractiveness of the farm areas to live. Hence since the cost of transport of the study area was high, it suggests that skilled labours have difficult access to the area and also unattractive to skilled labour to live.

CONCLUSION AND RECOMMENDATION

Skilled labour adoption was an innovation that was discovered to be used by most sampled farm household in yam production. Skilled labour adoption promotes efficiency in production. Out of the four factors that were important in explaining the adoption of skilled labour, three were found to have positive effect on the likelihood of its use and were statistically significant at 1, 5 and 10% level, respectively. These characteristics were producer price ($p<0.05$), competition ($p<0.01$) and market integration ($p<0.1$). Cost of transportation affected the likelihood of skilled labour use negatively at a significant level of $p<0.01$. Based on the findings the study recommends that a deliberate policy should be developed in order to improve upon the income levels of these labours in order to ensure the effective maintenance and continuity of the labours. The study further recommends that policy makers should introduce a Minimum Support Price (MSP) to serve as a form of market intervention to insure yam producers against any sharp fall in yam prices so that producers can obtain regular income and maintain or increase the adoption of skilled labours. Policies geared towards improving easy access to transportation facilities to the farm and market should be implemented in order to improve easy access to the market, increase market integration and also reduce the cost of transportation to the market centers. Furthermore, policies should be developed to incorporate labour saving technologies such as draught power for tillage and/or transportation in order also to reduce the cost of production on the part of the farmers. The implementation of the above mentioned policies will help farm households to adopt more skilled labour in the production of yam in order to compete in export market and increase the income level of skilled labour.

REFERENCES

Aidoo, R., 2009. An analysis of yam consumption patterns in Ghanaian urban communities. Ph.D. Thesis, Department of Agricultural Economics, Agribusiness and Extension, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Anaadumba, P., 2013. Analysis of incentives and disincentives for cassava in Ghana. Technical Notes Series, Monitoring African Food and Agricultural Policies (MAFAP), FAO, Rome, Italy, June 2013.

Bartel, A.P. and F.R. Lichtenberg, 1985. The comparative advantage of educated workers in implementing new technology: Some empirical evidence. NBER Working Papers No. 1718, National Bureau of Economic Research. http://www.nber.org/papers/w1718.pdf

Bernard, A.B. and J.B. Jensen, 1997. Exporters, skill upgrading and the wage gap. J. Int. Econ., 42: 3-31.

Dunne, T., J. Haltiwanger and K.R. Troske, 1997. Technology and jobs: Secular changes and cyclical dynamics. Carnegie-Rochester Conf. Ser. Public Policy, 46: 107-178.

FAOSTAT., 2015. Crops production. Food and Agriculture Organization Cooperate Data Base FAOSTAT, FAO Statistics Division, Rome, Italy.

Field, A.P., 2000. Discovering Statistics Using SPSS for Windows: Advanced Techniques for the Beginner. Sage Publications, London, UK., ISBN-13: 9780761957553, Pages: 496.

Greene, W.H., 2008. Econome tric Analysis. 6th Edn., Prentice Hall, New York, ISBN-13: 9780135132456, Pages: 1178.

Greenwood, J. and A. Seshadri, 2004. Technological progress and economic transformation. Working Paper No. 10765, National Bureau of Economic Research, September 2004, Cambridge, MA., pp: 1-58.

Guadalupe, M., 2007. Product market competition, returns to skill and wage inequality. J. Labor Econ., 25: 439-474.

Machin, S., 1996. Changes in the Relative Demand for Skills in the U.K. Labor Market. In: Acquiring Skills: Market Failures, Their Symptoms and Policy Responses, Booth, A.L. and D.J. Snower (Eds.). Cambridge University Press, Cambridge, UK., ISBN -13: 9780521479578, pp: 127-146.

Maliki, R., B. Sinsin and A. Floquet, 2009. Factors influencing adoption of the technologies of sedentarization of yam in centre of Benin (West Africa). FAO, FSA/UAC, CIRAD.

Marcotte, M. and R.M. Al-Hassan, 2005. Irradiation quarantine-export development feasibility study. WATH Technical Report No. 11, West Africa Regional Program, October 2005, pp: 1-45.

McQuaid, R.W., M. Greig, A. Smyth and J. Cooper, 2004. The importance of transport in business' location decisions. January 2004, Napier University, pp: 126. http://stopstanstedexpansion.com/documents/sse10_appendix_9.pdf

Nisha, N., 2008. Woman labour in agriculture-an economic analysis. M.Sc. Thesis, University of Agricultural Sciences, Dharwad.

Nnadi, F.N. and C.D. Akwiwu, 2007. Farmers\'discontinuance decision behaviours of yam minisett technology in Imo state, Nigeria. Int. J. Agric. Rural Dev., 9: 80-85.

Osburn, J., 2001. Occupational upgrading and changes in capital usage in U.S. manufacturing industries, 1989-98. Rev. Income Wealth, 47: 451-472.

Osei-Assibey, E., 2015. Export promotion in Ghana. African Center for Economic Transformation (ACET), Department of Economics, University of Ghana, Ghana, February 2015.

Seidu, M., 2013. Trade potential factors affecting hired labour adoption in yam production in Ghana. Int. J. Soil Crop Sci., 1: 17-24.

Seidu, M., 2014. Influence of trade liberalization and its related policies on the adoption of mechanized ploughing in yam cultivation in kpandai district in Northern Region, Ghana. ADRRI J. Agric. Food Sci., 1: 1-13.

Srivastava, M.K., 1993. Agricultural Labour and the Law: Socio-Economic Problems and Legal Protections. Deep and Deep Publications, New Delhi, India, ISBN-13: 9788171004942, Pages: 335.

Stephanie, V.E., 2007. Determinants of environmental innovations in the swiss and german food and beverage industry. Ph.D. Thesis, University in Zurich, Switzerland.

Thiele, R., 2002. Price incentives, non-price factors and agricultural production in sub-Saharan Africa: A cointegration analysis. Kiel Working Paper No. 1123, Kiel Institute for World Economics, July 2002, Germany, pp: 1-26.

USDA., 2010. Economic payoffs to more unified markets. United States Department of Agriculture (USDA), Washington, DC., USA.