

Binary logit analysis of social economic variables influence on Nigerian youths' participation in agriculture

by

Adebanjo Joseph FALAYE* (*corresponding author*)

Accounting & Finance Department,
Landmark University, Omu-Aran, Nigeria
falaye.adebanjo@lmu.edu.ng
<https://orcid.org/0000-0002-1854-8475>
+2349015444689

Modupe AKE²

Political Science Department,
Landmark University, Omu-Aran, Nigeria
ake.modupe@lmu.edu.ng

Ogadimma ARISUKWU³

Sociology Department,
Landmark University, Omu-Aran, Nigeria
arisukwu.ogadimma@lmu.edu.ng

Bamidele RASAK⁴

Sociology Department,
Landmark University, Omu-Aran, Nigeria
rasak.bamidele@lmu.edu.ng

Oluwasegun ESEYIN⁵

Economics Department,
Landmark University, Omu-Aran, Nigeria
eseyin.oluwasegun@lmu.edu.ng

Festus ASAMU⁶

Sociology Department,
Landmark University, Omu-Aran, Nigeria
asamu.festus@lmu.edu.ng

Ifeyinwa Sandra DIARAH⁷

Accounting & Finance Department,
Landmark University, Omu-Aran, Nigeria
Diarah.ifeyinwa@lmu.edu.ng

Abstract

On a large scale albeit due to conflicts, climate change, acts of terrorism in Sub-Sahara Africa and some other peculiar factors the oddities of food shortage and hunger keep rising in recent years; making it an issue of global concern. To ameliorate the situation, successive governments in Nigeria have invested tremendously in agriculture but to no avail. Making the situation worse is the fact that young people that would have embraced technology in farming are seemingly not seeing desired results; hence they abstain and prefer to seek new ways of sustenance. The general opinion is that youths of this nation are lack interest and have not been adequately stimulated or successfully motivated into agriculture; hence they prefer white collar jobs to farming. It is in view of the above reasons that this study chose to corroborate some other studies conducted on some other localities in Nigeria to investigate factors that could really motivate Nigerian youths into agriculture. Hence, we decided to use frequencies, percentage counts, and binary logit to analyse data. Results show that youths' involvement in agriculture particularly in the study area is over 90%. In addition, age, marital status, and level of education all play some role in who participate in agriculture. Further, the results show that publicity of government pro-youths' agro allied programmes and the availability of fertile land in the study locality would more than all the other tested factors influence youths' involvement in agriculture. Hence, government is better informed to properly channel public fund.

Keywords: food, hunger, logistic, variables, probit

JEL Classifications: Q01, Q10, Q18, O55, E2, E23, E26

Contribution/Originality

This study investigated the social-economic factors that could inspire Nigeria youths in Kogi State to involve in agriculture. The study established that provision of fertile land and rich publicity of government backed agricultural policies would enhance youth participation in food production. The research shows that provision of fertile lands would mostly motivate the youths to farming. Descriptive analysis of data shows that despite the not so good quality of the available land in Kogi, more than 90% of youths in Kogi involve in one or two types of agri-business. This study, apart from being the first of its kind on Kogi youths, it is the most current on the topic in Nigeria. It will be a good informative base for policy makers in the state.

Introduction

Food and its provision constitute one of the most essential necessities of human existence. Therefore, as human population increases globally, there ought to be commensurate increase in global production of food (West et al., 2014). To realise this, it is expected of youths in every country to maximally take part in the organic provision of foods such that would engender healthy consumption, food security and growth. Haven being used to healthy consumption and growth; the issue of food security is gradually gaining wider recognition and concern globally (Adebayo et al., 2016). Food security is presently a prioritised goal of United Nations' sustainable development agenda (Allee et al., 2021). West et al. (2014) assert that achieving justifiable universal food security is already a challenge. It is generally believed that global hunger has begun to rise in recent years, returning to levels from a decade ago (Molotoks et al., 2021), hence, the need to proffer lasting solutions to the observed relatively decreasing global food supply. In contributing to finding a way out, Forum and Security (2018) suggest youth involvement in agriculture. In few words, some prior researches on youth engagement were grounded in attachment theory and youth development theory. From the outset, youth development theory base on

building resilient communities where youth are surrounded by adult support, while attachment theory attempts to explain the function and need of long-term meaningful relationships, which ensures proper social and emotional development of youngsters in their communities. Youths have fabulous potentials to engender economic growth and development.

In Nigeria, government already established numerous projects over the years to improve food production via youth involvement (Ogunmodede et al., 2020), but the impact has been negligible. Amaechi (2019) opine that the problem of food shortage in Nigeria ensued from a moment of neglect due to crude oil discovery. Presently, the economy is faced with food shortage and youth unemployment (Fasoyiro and Taiwo 2012). Afande et al. (2015) is of the belief that 70 percent of the population in Kenya is under age of thirty, but their participation in agriculture keeps decreasing. Thus, youths' lack of enthusiasm for agriculture should be of genuine concern (Aphunu and Atoma 2011). As declared by Tiraieyari and Krauss (2018) sufficient data shows that drawing the youth to agriculture has become a task for a lot of countries.

Nevertheless, contrary to the opinion of Afande et al. (2015) and Tiraieyari and Krauss (2018) on youths' abstinence from agriculture Mohammed and Isah (2017) claims that almost 70 percent of the Nigerian youth are employed in agriculture. Further, Alabi et al. (2019) examined the involvement of youth in agriculture in Ogun state, Nigeria. Findings reveal that a lot of youths involve in various agricultural sectors in the area. To the best of our knowledge, no study has been done on the factors that motivate Kogi State youths into agriculture; hence this study. Meanwhile, Nor et al. (2015) highlights lack of in-depth research to address the roles youths could play in the development of agriculture. Findings are that very few empirical studies have been published on motivating factors that could attract these young people to participate in modern agriculture programmes.

Concluding, Aphunu and Atoma 2011) is of the view that next generation of progressive citizens will largely be made up of youths that continue to wax strong in agriculture. Hence, more attention could be focused on developing qualitative preservation and packaging mechanisms to boost production of foods across Africa. What should be further considered is the need to creatively design cogent financial structure in aid of agriculture as a viable investible business. This would nullify Ojo (1989) as cited by Falaye et al (2016) report of existing financial structure in Nigeria that does not engender growth. Moreover, two research questions raised to propel study are if Kogi State's youths could be inspired into partaking in farming or related business; and which social-economic factor(s) mostly stimulate youths into agriculture business? Hence, the study's hypotheses are that fifty percent of Kogi State youths cannot be motivated to partake in agriculture or related business; and that no motivational factor can stimulate 50% of Kogi State youths into agriculture. In this regard, the primary goal of this study is to find if half of the study participants could engage in agriculture related venture, and to examine factors that truly motivate youths into agriculture in order of influence.

Materials and methods

Study is exploratory: it set out to partake in solving socio-economic problems of food insecurity. It equally qualifies as an action research. The issue of food security is focal and so prioritized as one of the United Nations' Sustainable Development Goals. Meanwhile, research questionnaire was used to collect categorical data for study, and utilized SPSS to run binary logit regression in finding if some government backed socio-economic factors do motivate the youth into agriculture or related businesses. Using stratified and convenience sampling methods, we collected data via cross-sectional survey of

three randomly selected local government areas in Kogi State. The collected data were from among the youth population that reside and earn their daily livelihood in the various local government council areas under study. We engaged Cochran's formula as cited in Hemanta et al. (2012) for calculating sample size when the population is infinite:

$$n_0 = \frac{z^2 pq}{e^2}$$

Where:

n_0 = the sample size

z = the selected critical value of desired confidence level

p = estimated proportion of an attribute present in the population

$q = 1 - p$

e = desired level of precision

Hence, with 95% confidence level and 0.1 level of precision (e), we estimated 96 samples per local government surveyed and attempted to obtain data from 100 participants in each of the local government areas covered by study. We utilized 300 copies of structured questionnaire. One-hundred copies of the questionnaire were utilized in each of the municipal council areas. For effectiveness, research assistants collected data in the areas selected via stratified sampling. In recognition of the fact that all research surveys be ethically guided, we drew from various tutorials organised by Landmark University Research Ethics Committee before the survey was embarked upon; and ensured that all participants in the survey willingly responded to the questionnaire they were supplied with. This is in consonant with the issued Ethical Approval of the Ethics Committee.

The questionnaire was structured into six sections to obtain information relative to study participants' demographic data, employability factors, awareness of agriculture as a viable employer, problems that youths encounter in agriculture, youth migration, and inspiring youths' involvement in agriculture. To collect the necessary data, 32 simple questions were created. The phone number of each responder was sought on the questionnaire to guarantee that the research assistants did honest job. Investible monies into agriculture, agricultural policies, facilities in place to increase farm yields, and agriculture-oriented enlightenment initiatives are among the variables of the study as discussed in Falaye et al. (2022).

Priori expectation

The factors that the government of Kogi already engaged to motivate the youths into agriculture include loanable funds made available by government, publicity of government policies directed towards improving farming, availability of fertile land that could be permanently used for farming, amenities made available to boost, harvest, and store farm yields, and education relating to improving agriculture. We perceived these factors do not really inspire the youths into agriculture, and were conceptualised as stated below.

Conceptual logistic regression model:

$$Y_i = B_0 + B_i (f + p + l + a + t) + e$$

Where:

Y_i = Dependent binary variable (interested = 1; not interested = 0)

f = Funds availability that could be invested into agriculture

p = Publicity of policies directed towards improving farming

l = Fertile land that could be permanently used for farming

a = Amenities made available to boost, harvest, and store farm yield

t = Trainings relating to improving agriculture
 B_0 = Constant
 B_i = Regression coefficient
 e = Stochastic error term

Dependent binary variable = involvement in agriculture (interested = 1; not interested = 0)
 Independent variables = publicity (awareness); education (training); land (fertile-land); funds (loan-facility); amenities (power-supply, improved-seedlings, fertilizer/agrochemicals, machinery)

Results

Chart 1: Frequency distribution of types of agriculture engaged in

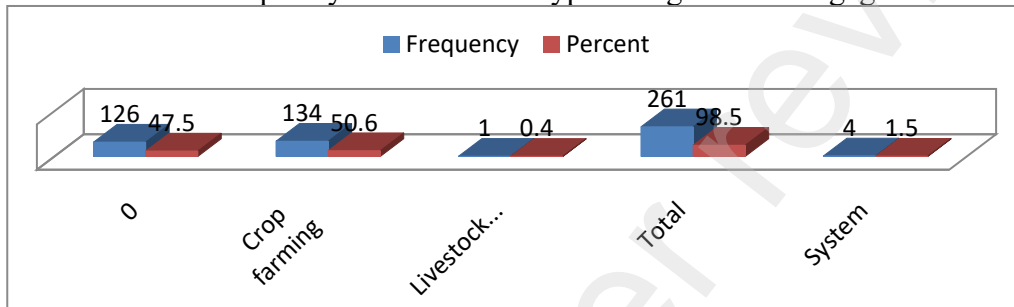
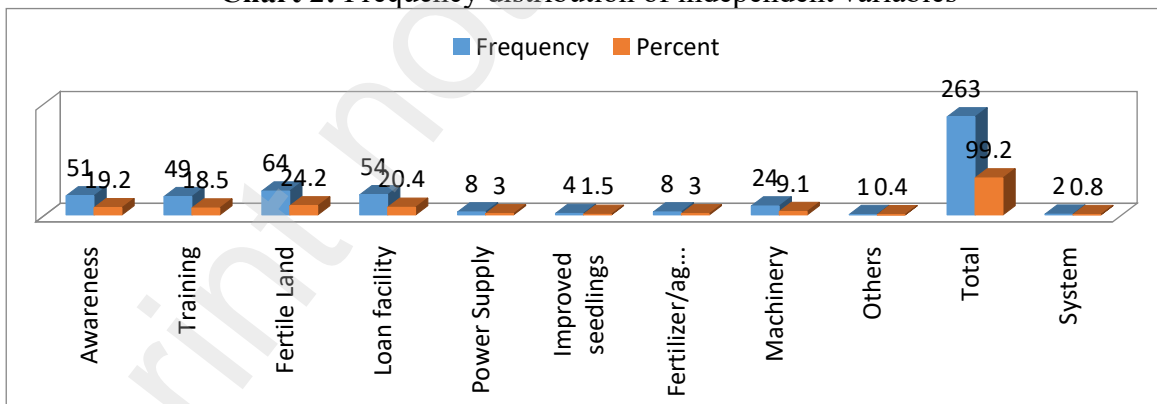


Chart 2 below shows the frequency distribution of predictor variables that motivate the youths to agriculture. These factors include the study variables like funds that could be invested into agriculture; publicity of government policies directed towards improving farming; fertile land that could be permanently used for farming cash crops; amenities made available to boost, harvest, and store farm yields; and periodic trainings relating to improving agriculture.

Chart 2: Frequency distribution of independent variables



Among the expected agriculture motivating variables, fertile land ranks highest, having 64 (24.3%) respondents in its favour. Thus, availability of fertile land is considered as the most motivating factor among the sampled motivating variables in agriculture. Next to it are funds that could be invested into agriculture on a large scale, such that could engage the youths in mechanised farming. This variable garnered a total of 54 (20.5%) respondents out of 263. One other identified youth motivating factor is publicity of agriculture programmes that could motivate the youths, which government could put on air as radio jingles or mild television advertisements periodically. This has a total of 51 (18.6%)

respondents. Then, we have agro-allied trainings and requisite machinery that could measure the youths up to modern agricultural techniques. These pulled the totals of 49 (18.6%) and 24 (9.1%) respondents respectively. The other motivating variables include regular power supply to enable optimum functioning of electrical agricultural equipment; and farm inputs like fertilizers and improved seedlings. Responses in favour of these three variables are 8 (3.0%), 8 (3.0%), and 4 (1.5%) respectively. The last of the variables under consideration in the study is the support extended to the engaging youths by members of their immediate families or the community where they practice agriculture. This is pulled just 1 (0.4%) of the entire respondents.

Omnibus Tests of Model Coefficients

Step 1		Chi-square	df	Sig.
	Step	3.377	8	0.908
	Block	3.377	8	0.908
	Model	3.377	8	0.908

The overall model is not statistically significant, $X^2(8) = 3.38, p > .05$

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	9.763 ^a	0.013	0.262

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

We calculate pseudo R^2 values using Cox & Snell R Square and Nagelkerke R Square values, which explains variation. The explained variation in the dependent variable based on our model ranges from 01.3% to 26.20%.

Table 1: Model Summary

MOTIVATORS	Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Awareness	1	63.449a	0	0
Training	1	66.925b	0	0
Fertile Land	1	78.546c	0	0
Loan facility	1	71.938d	0	0
Power supply	1	8.376e	0	0
Improved seedlings	1	5.545f	0	0
Fertilizer/agrochemicals	1	5.742g	0	0
Machinery	1	33.271h	0	0

Table 2: Variables in the Equation

MOTIVATORS			B	S.E.	Wald	df	Sig.	Exp(B)
Awareness	Step 1	Constant	0.783	0.302	6.728	1	0.009	2.187
Training	Step 1	Constant	0.288	0.289	0.993	1	0.319	1.333
Fertile Land	Step 1	Constant	0.644	0.269	5.717	1	0.017	1.905
Loan facility	Step 1	Constant	0.343	0.279	1.513	1	0.219	1.409
Power supply	Step 1	Constant	-0.916	0.837	1.199	1	0.273	0.4
Improved seedlings	Step 1	Constant	0	1	0	1	1	1
Fertilizer/agrochemicals	Step 1	Constant	1.792	1.08	2.752	1	0.097	6
Machinery	Step 1	Constant	0	0.408	0	1	1	1

Owing to the fact that the sample size (265) is large enough, we did not subject the predictor variables to Box-Tidwell collinearity test to find if the interaction term of the continuous independent variables is statistically significant. Rather, we used the Wald test to determine statistical significance for each of the independent variables. The statistical significance test shows that only awareness ($p = .009$) and fertile land ($p = .017$) added significantly to the model/prediction, but training ($p = .319$), loan facility ($p = .219$), power supply ($p = .273$), improved seedlings ($p = 1.0$), agro-chemicals ($p = .097$), and machinery ($p = 1.0$) did not add significantly to the model. This as seen in the table shows that should all the other variables remain constant, awareness of agro related government policies would likely impact on youth participation 2.187 times more positively. In the same vein, provision of fertile land would likely impact on youth participation 1.905 times more positively.

Discussion

Binary regression analysis shows that from among the independent variables regressed, variations in both 'awareness' and 'fertile-land' could significantly motivate the youths in Kogi State to agriculture. Moreover, the obtained results show that training, loan facilities, electric power supply, improved seedlings, agro-chemicals, and machinery may not add significantly to operationalization of the model. Despite the not so good quality of the available land in Kogi, unexpectedly more than 90% of youths in Kogi involve in one or two types of agriculture or agro-allied business.

Meanwhile, the obtained results seem synonymous with that obtained by Aphunu and Atoma (2011) and Nor et al. (2015). Aphunu (2011) investigated rural youths' involvement in agricultural production activities in central agricultural zone of Delta State, Nigeria. The study analysed data using percentages, means and correlation coefficient. Findings show that more than half of the youths (52.3%) are mainly farmers, involved mostly in arable crop production. On its part, Nor et al. (2015) examined the factors that pre-disposes Malaysian youth towards agricultural entrepreneurship. Study used empirical tests such as factor analysis and logistic regression model on data gathered. Results prove that majority of the respondents have a positive inclination towards agro-entrepreneurship; and that awareness as a variable has an imminent statistically significant relationship on youth penchant towards agricultural entrepreneurship. Ahiwe et al. (2021) too was able to identify the need for more youths' involvement in

poultry keeping aspect of agriculture. The study observed that there is an increasing demand for animal protein in Nigeria. To meet up with the increase in demand for food, more youths' involvement in agriculture is needed.

Conclusion

The binary regression results truly reflect the generic characteristics of the study population in that Kogi State situates in not so arable land; quite a reasonable distant from the real southern states of Nigeria that domicile the savannah, even though the population is agrarian. Study concludes that a good advertising of any agriculture enhancement policy would most probably motivate the youth populace more into agriculture. Hence, we conclude that government should engage the services of soil scientists to research more into engendering the fertility of available lands in Kogi State, such that would yield bountiful harvests and thereby motivate the youth into farming. Besides, we suggest more investments in livestock breeding and poultry keeping.

Acknowledgement

We acknowledge the contribution of all the research assistants and various participants in the survey and all contributors to the research in term of review.

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Appendix

Chart i: Gender distribution of participants

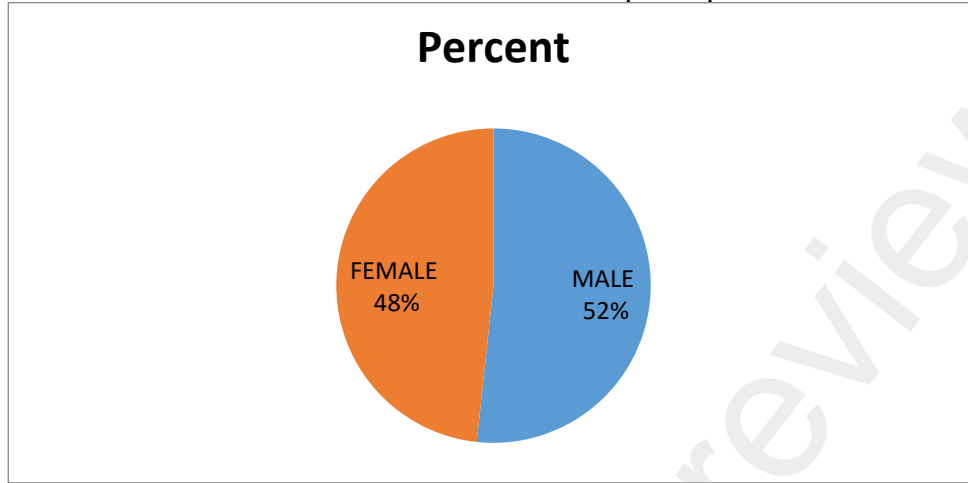


Chart ii: Age distribution of participants

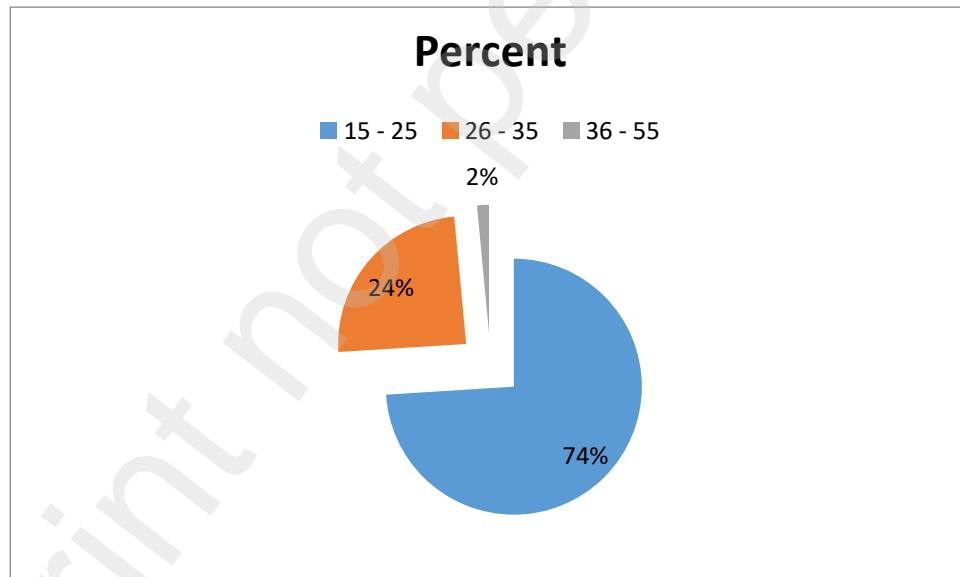


Chart iii: Marital distribution of participants

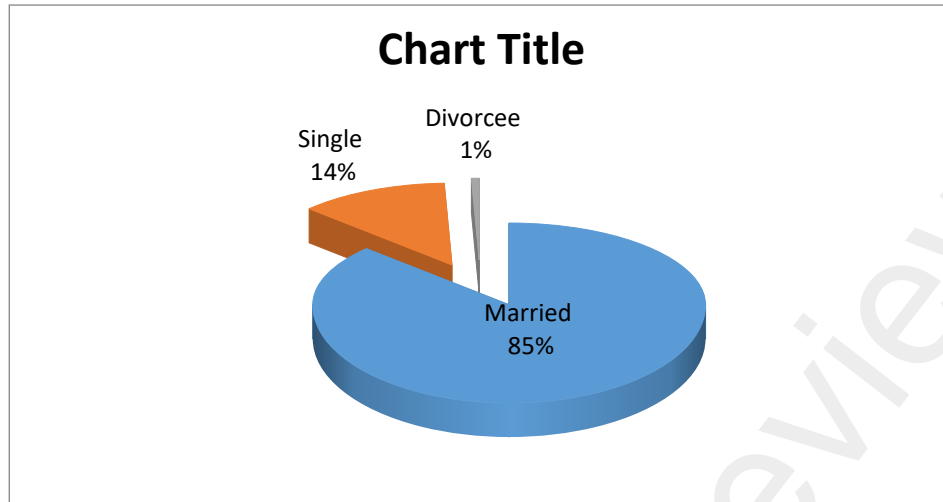


Chart iv: Religious affiliation distribution of participants

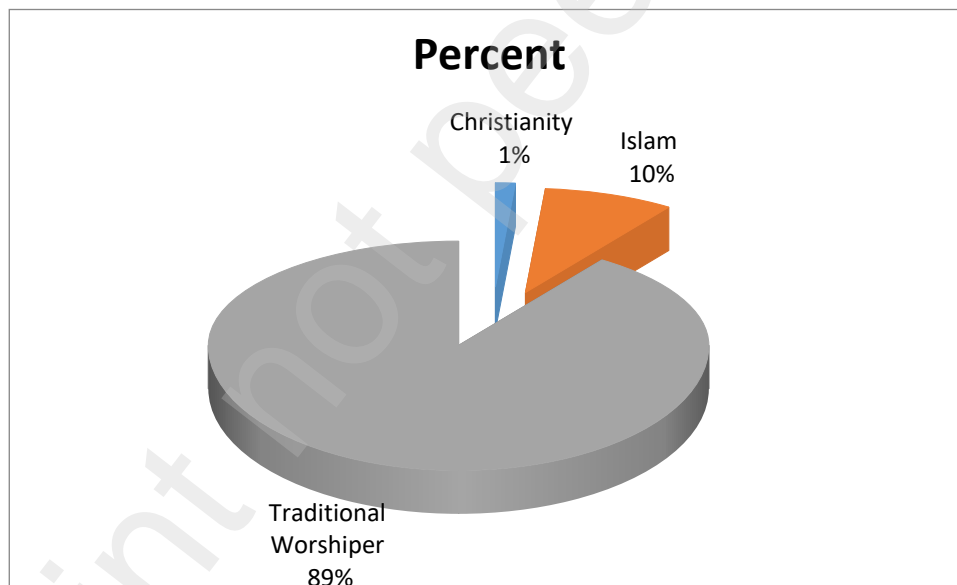


Chart v: Education attained distribution of participants

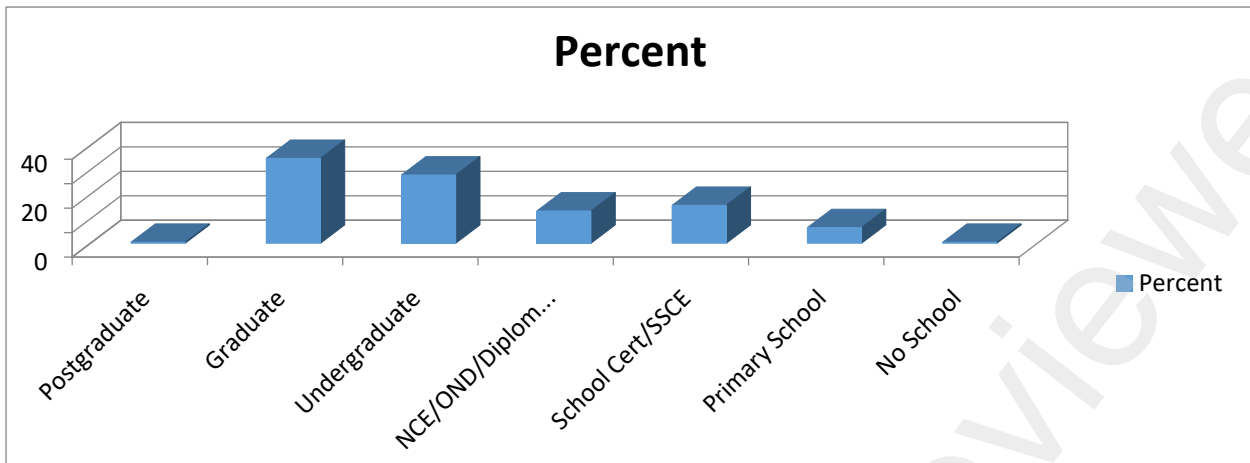
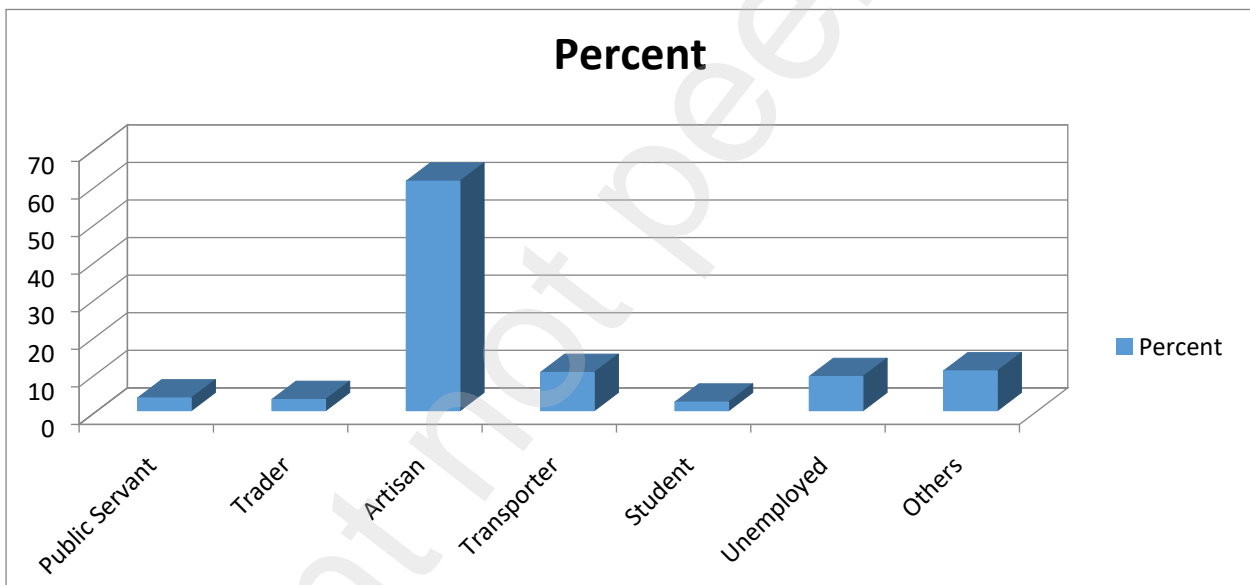


Chart vi: Occupation distribution of participants



Test of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PROFITS	.451	58	.000	.396	58	.000

a. Lilliefors Significance Correction

Kolmogorov-Smirnov test and Shapiro-Wilk test both produce 0.000 result. The tests' results of p-value < 0.05 prove that data used are not normally distributed; hence we transformed data.