Gwandi, O. *et al*, International Journal of Advances in Agricultural Science and Technology,
Vol.5 Issue.6, June- 2018, pg. 16-29 **ISSN: 2348-1358**
Impact Factor: 6.057
NAAS Rating: 3.77

ASSESSMENT OF LIVELIHOOD STRATEGIES AND INCOME DISTRIBUTION PATTERN AMONG FARMERS IN ADAMAWA STATE, NIGERIA

Gwandi, O., V. Kamalvanshi, P.S. Badal, Saket Kushuwaha, Chandra Sen
Department of Agricultural Economics, Institute of Agricultural Sciences,
Banaras Hindu University, Varanasi, 221005
(Email: godoffer2010@gmail.com)

ABSTRACT: ***This study assesses the livelihood strategies and income distribution pattern of food crop farmers in Adamawa State, Nigeria. The objective of the study was to examine the socio-economic characteristics of food crop famers and to analyze their income distribution pattern. A multistage random sampling technique was used to select 150 food crop farmers. Structured questionnaire survey was used to obtained data from the respondents in the study area. Descriptive statistics (percentages, mean and standard deviation), Line chart, Lorenz curve and Gini Coefficient was used to analyze the data obtained from the field survey. The study shows that majority 68.7% were full time farmers with average mean of 31 years of age and about 30.98 years of farming experience. Majority (85.3%) were male farmers and only 15.3% of the respondent had no formal education with average land holding of 1.39 hectare. The result reveals standard deviation of 185753.9 and average income of 46400.8 of the respondents. The result from the Gini Coefficient reveals that the overall Gini Index of income is 0.53 indicating relatively high income disparity among the respondents in the study area. The study recommended desirable development programs that will boost the income levels of the poor farmers for both redistribution and poverty alleviation purposes.***
Keywords: Livelihood, strategies, Income Distribution, Adamawa State, Nigeria.

INTRODUCTION

Agriculture remains the main source of livelihood and employment in most developing countries including Nigeria. Over 70% of the Nigerian population engages in agricultural enterprise despite the advent of the machine age and the fact remains that agricultural enterprise provide livelihood for more than three quarters of the human race (Oladipo, 2005, Gwandi *et al*, 2010). The important of Agriculture in nation development cannot be over emphasized. In addition to providing raw material to industries of the economy where the remaining portion of the population get livelihood, greater proportion if not all of the human race depend largely on agriculture. The farming household livelihood is entirely dependent on agricultural activities,

 ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

where they grow crops, gets food for themself and the family, then the surplus if any is sold for cash with which they obtain other life necessities. Put it in another way, agricultural enterprise serve as a major source of income for rural farmers more especially in the developing world including the major role its play in providing food for the growing population.

Olayide and Olayemi (1998) put it in a convincing way by saying the ultimate "goal of the plan of agricultural production in national development is to raise the living standard of the people". However, living standard is related to many factors and to measure it involves considerable attention to a number of variables. Olayide *et al* (1998) reported that the most important "yardstick for measuring living standard" is by looking at the average distribution of income of the rural dwellers. In 2001 and 2003 the World Bank has reported that income inequality exists in high level in many developing countries of Africa of which Nigeria is one. Majority of the farmers live in rural areas as agrarian with majority of them having just a small piece of land which they grow food crops that is hardly sufficient to feed them and their families talk less of generating surplus for sell in other to gets income to carter for the other life necessities.

Evidence from past studies have shown that the economies of these rural farmers are heavily dependent on agriculture as the primary source of income. Income distribution pattern has been a concern to economists for a long time. The nature of the distribution of wealth and income among the citizen of a nation is of importance because it determine the favorable environment for economic growth and development. Despite the efforts by various developing countries to reduce poverty, there is lack of sufficient knowledge to holistically design approach to solve the issue of income inequality. The consequence of income inequality is far reaching that results to unfavorable environment for economic growth and lead to discontent, violence and corruption. There is a clear need to understand the link between the socio-economic characteristic and the total income inequality. It is in this light that this study tries to shed light on the structure and dynamics of income distribution pattern with the socio-economic characteristics of food crop farmers in the study area. The objective of this study is

 ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

to examine the socio-economic characteristics of the farmers and to determine the income distribution pattern among the farmers in the study area.

Methodology

Description of the study area

The study was conducted in Adamawa state Nigeria. Adamawa State is located in the North East part of Nigeria between latitude 7.0^0 N and 11.0^0N of the equator and longitude 11.0^0E and 14.0^0E of the Greenwich meridian (Adaebayo, 1999). The State was created in 1991 from the defunct Gongola State. The state shares common boundary with Taraba State in the south and west, Gombe State in the North West and Borno State in the North. Adamawa State has an international boundary with Cameroun Republic along its eastern border. The State covers a land area of about 38,741 square kilometers and is divided into 21 Local Government Areas (LGA). The state has population of 3,161,374 people comprising of 1,580,333 males and 1,581,041 females (NPC, 2006). As opposed to a national annual population growth rate of 3.2%, the population of Adamawa State is growing at 2.8% per annum (Adamawa State MDGs report, 2006). By 2015, the state is expected to have 4,067,411 inhabitants.

The State has a tropical climate marked by dry and rainy seasons. The rainy season commences in April and ends in late October. The wettest month is August and September. The mean annual rainfall pattern shows that the amounts range from 700mm in the North-West part to 1600mm in the southern part (Adebayo, 1999). The mean annual rainfall is less than 1000mm in the central and north-west part of the State. On the other hand, the north-eastern strip and the southern part have over 100mm of rainfall. The temperature characteristic in the state is typical of the West Africa Savannah. The climate is characterized by high temperature almost throughout the year due to high solar radiation which is relatively evenly distributed throughout the year. Maximum temperature in the state can reach 40^0C particularly in April, while minimum temperature can be as low as 18^0C between December and January. Mean monthly temperatures

 ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

in the State ranges from 26.7 ^{0}C in the south to 27.8 ^{0}C in the north eastern part of the state. The major economic activity of the inhabitants is agriculture (farming, fishing and cattle rearing).

Sampling procedure and Data Collection

Adamawa State is made up of 21 local Government areas (LGAs)) and is divided into four agricultural zones by the Adamawa State Agricultural Development Programme (AD.ADP) for administrative convenience namely the south west zone, the central zone, the North West zone and north east zone. Multi-stage random sampling technique was employed in the selection of respondents in these zones. In the first stage one local government area were randomly selected in each of the AD.ADP zones, to give a total of four sampled local government areas. In the second stage two villages were randomly sampled in each of the selected local government areas to give a total of 8 sampled villages. The third stage sampling involved the random selection of 150 farmers in the 8 villages.

Primary data was used for the study, which was obtained through the administration of questionnaire to farmers in the sampled villages with the assistance of trained personnel. The data collected was for 2016 and 2017 farming seasons.

Methods of Data Analysis

Descriptive statistics (frequencies, percentages, mean and standard deviation) was used. Gini coefficient and Lorenz curve was used to analysed the income distribution of farmers in the study area. The Gini-coefficient is a measure of statistical dispersion most prominently used as a measure to show the degree of income distribution or inequality of wealth distribution between different households in a population. According to the IMA journal of management mathematics (2008). Gini-coefficient is defined as a ratio with values between zero and one (0-1). A low Gini-coefficient indicates more equal income or wealth distribution while a high Gini-coefficient indicates more unequal distribution. Zero (0) corresponds to perfect equality while (1) corresponds to perfect inequality. The Gini-coefficient is a precise way of measuring the position of the Lorenze curve, the total value of income from each farmer was used to compute the Gini-Coefficient. As an index of measurement, it is easily ascertainable and more reliable. The Gini-

 ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

coefficient was computed using the following formular after Okereke and Anthonio (1988); Bila and Bulama (2004) and Adinya *et al*., (2006). The model is specified:

$GC = 1-\sum XY$

Where

GC = Gini- coefficient.

X = Proportion of farmers

Y = Cumulative proportion of total income.

$\sum$ = Summation sign

Result and discussion

The distribution of the respondents by gender is presented in Table 1. It shows that majority(85.3%) of the respondents were males, while females constituted only 14.7%, which showed that food crop production in the study area was mostly undertaken by the male gender. The dominance of the male in the food crop production activities may be due to the fact that men are the ones saddled with the responsibility of taking care of the family and the low percentage of women participating in farming activities may also be explained by socio-cultural factors affecting women.

Table 1 revealed the distribution farmers age in the study area and shows that majority 78.6% of the respondents were between the ages of 31-60 years of age, while 8.0% and 13.3% were between the ages of 15-30 and >60 years respectively. The mean age of the respondents was found 47.34 years which is an indication of significant variation in age of the respondents who are relatively young and physically active. This has direct bearing on the availability of able-bodied manpower for primary production. Moreover, age influences the ability to seek and obtain off-farm jobs and income, which could increase farmers' income and ultimately their production capacity. Parikh Fasasi (2007) and Gwandi (2012) reported a significant relationship

ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

between farmers' age and efficiency in agricultural production where younger farmers have the tendency to operate more efficiently than older farmers.

The distribution of the respondents by marital status is presented in Table 1. The table revealed that about 76.70% of the respondents were married, while about 12.0% were singles. Widows and the Divorced constituted 8.0% and 3.3% respectively. The implication of marital status on agricultural production can be explained in terms of the supply of agricultural family labour. The supply of family labour would be more where the household heads are married.

Table1 also reveals that majority 52.0% of the respondents have household size between 1-5, while 41.3% and 6.7% have household size between 6-10 and above 10 respectively. The mean household size is 5.6. The number of persons in households is very important in determining the labour available for farm-work. It also affects household income and its food requirements. Table1shows the educational level of the respondents, the result shows that majority 84.7% had formal education, while only 15.3% had no formal education. This study reveals that literacy level is high among the respondents and this could have implication on agricultural production in the area. Education affects productivity through a choice of better inputs and output, and through a better utilization of existing inputs. Adoption of agricultural innovations is also easier and faster among the educated farmers than the uneducated farmers as reported by Amaza *et al*. (2006)

Majority 68.7% of the respondents indicated that farming is their main source livelihood as it is shown in Table1, while only 31.3% of the respondents had other occupation other than farming as their main source income.

 ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

Table1 also reveals the farming experience of the respondents in the study area with majority 40% and 40% having experience between 20-30 and above 30 respectively, while 18.7% and 4.7% had experience between 11-20 and 1-10 respectively. The mean years of farming experience is about 30.4. This indicates that most of the respondents were well experienced in food crop production.

Table1 reveals the farm size of the respondent with majority 31.3% had farm land of 2.6-3.5, 28.0%, 27.3% and 13.3% had farm size between 3.6-4.5, 1-2.5 and above 4.5 hectares of land respectively. The mean farm size of the respondents is about 3.4 hectares. This reveals that farmers in the study area are mainly small scale farmers. According to Awoke and Okorji (2005), small scale farmers are farmers who cultivate between 0.1 and 5.99 hectares and produce on subsistence level.

Table 2 shows livelihood profile and income distribution pattern of the food crop farmers in Adamawa State, Nigeria. The income distribution described the number and income distribution of farmers in the study area. It determines income distribution pattern among the food crop producers which defines a situation where a few large farmers have the largest share of the income. The income distribution pattern was determine by means of gini- coefficient using the total value of income obtained from various food crop grown by farmers as an index of measurement.

Table 2 reveals that about 28% of the respondents had income between 41000-504500 accounting for 28% of the total income volume. About 16% with average income ranging between 315500-397500 representing 13% of total volume of income, and 12% had income between 212500-307000 and 508000-601000 representing 07% and 15% of income volume

ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

respectively. 10% of the respondents had income between 603500-701500 which represent 15% of total volume of income. The result reveals the overall Gini index among the food crop farmers in the study area as 0.53 meaning is relatively high. This means that income disparity is relatively high among them. This finding is in consonant with the findings of Oyekale *et al* (2006) in their study of measurement and sources of income inequality among rural and urban household in Nigeria. This could be as a result of the heterogeneous nature of income received in the rural area.

Table 3 and Figure 1 presents the total household income distribution among the respondents which include income from food crop production such as maize, paddy, sorghum, groundnut and cowpea. Table 3 revealed that the average income earned by an average food crop farming household was about 46400.8 per annum with minimum and maximum household income of 224312.5 and 1994500 respectively. The Standard Deviation was 185753.9.

Figure 1 shows the graphical representation of the Gini coefficient index while figure 2 shows graphical distribution of income among the food crop farmers in the study area

Table 1: Socioeconomic Characteristic of the Respondents (N=150)

Variables	Frequency	Percentage
Age		
15-30	12	8.0
31-45	59	39.3
46-60	59	39.3
>60	20	13.3
Gender		
Male	128	85.3
Female	22	14.7
Marital Status		
Married	115	76.7
Single	18	12.0
Widow	12	8.0
Divorce	5	3.3

ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

Household size		
1-5	78	52.0
6-10	62	41.3
>10	10	6.7
Educational Level		
Non- Formal Education	23	15.3
Primary	24	16.0
Secondary	39	26.0
Tertiary	64	42.7
Years of Experience		
1-10	7	4.7
11-20	28	18.7
21-30	60	40.0
>30	55	40.0
Farm size		
1-2.5	41	27.3
2.6-3.5	47	31.3
3.6-4.5	42	28.0
>4.5	20	13.3
Occupation		
Farming	103	68.7
Other occupation	47	31.3

Source: Field Survey 2017

Table 2: Livelihood Strategies and Income Distribution pattern of the respondents in Nigeria

INCOME RANGE	FARMERS FREQ	PROPORTION OF FARMERS	COMM FREQ	COMM PROPORTION	TOTAL OF INCOM	PROPORTION OF INCOME	COMM PROPORTION OF INCOME	XY
110500-209000	13	0.086666667	13	0.086666667	2243125	0.03222875	0.03222875	0.002793
212500-307000	18	0.12	31	0.206666667	4718000	0.067787235	0.100015984	0.012002
315500-397500	25	0.166666667	56	0.373333333	8884500	0.127650633	0.227666617	0.037944
41000-504500	42	0.28	98	0.653333333	19181500	0.275595769	0.503262386	0.140913
508000-601000	19	0.126666667	117	0.78	10393500	0.149331628	0.652594015	0.082662
603500-701500	16	0.106666667	133	0.886666667	10357500	0.148814388	0.801408403	0.085484
703000-760000	8	0.053333333	141	0.94	5895750	0.0847089	0.886117302	0.04726
824250-864000	7	0.046666667	148	0.986666667	5931750	0.08522614	0.971343442	0.045329
898500-1096000	2	0.013333333	150	1	1994500	0.028656558	1	0.013333
Total	150							0.467721

Source: Field Survey 2017

Gini-Coefficient=1-$\sum$ XY

GC = 1 – 0.467721

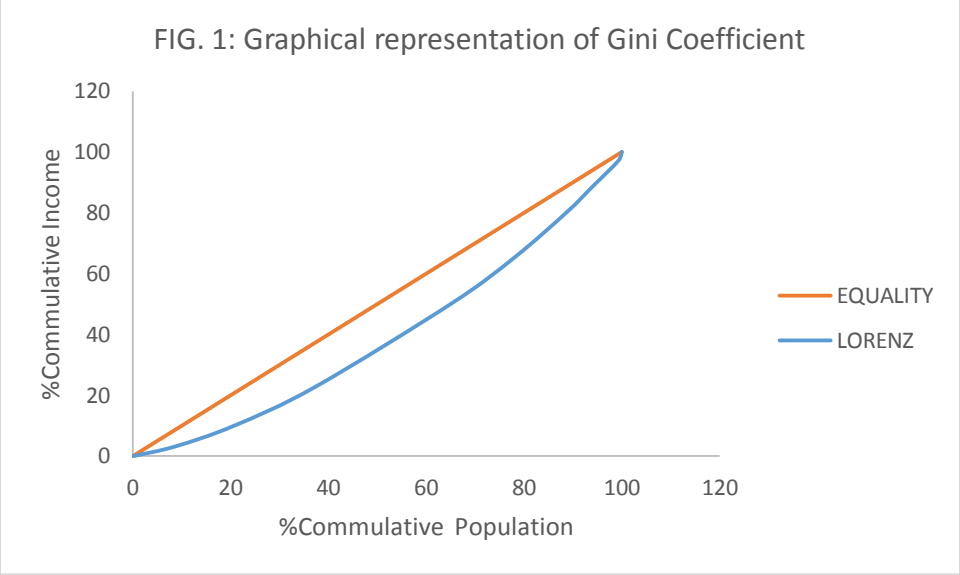
= 0.5322

ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

Table 3: Total Household Income Distribution among food crop Farmers

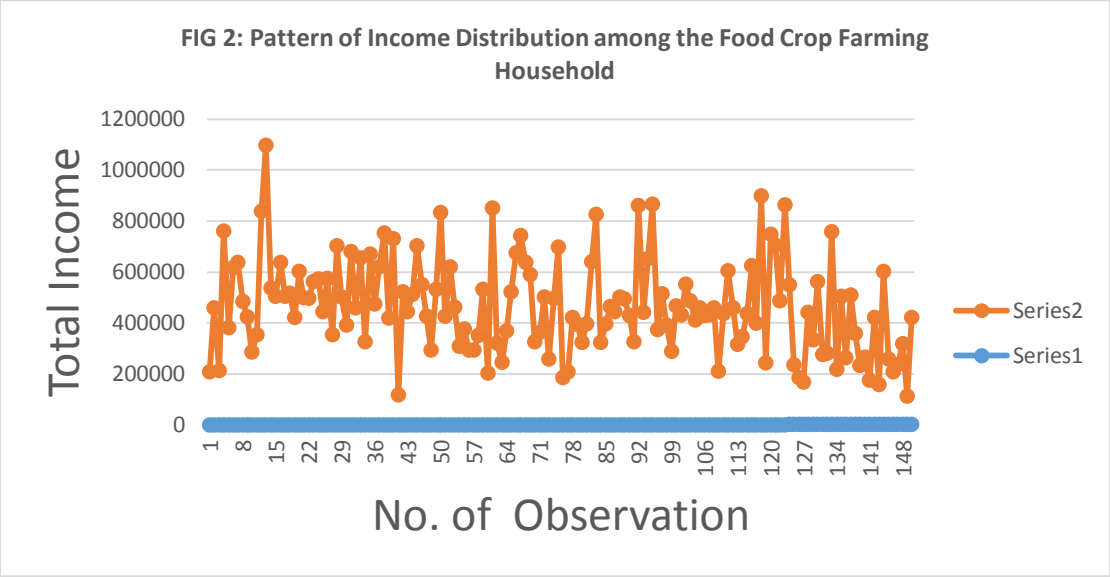
TOTAL INCOME	%INCOME	%C0MM INCOME	%POP	%COMMPOP
	0	0	0	0
2243125	3.222875	3.222875	3.222875	8.7
4718000	6.778723	10.0016	10.0016	20.7
8884500	12.76506	22.76666	22.76666	37.3
19181500	27.55958	50.32624	50.32624	65.3
10393500	14.93316	65.2594	65.2594	78
10357500	14.88144	80.14084	80.14084	88.7
5895750	8.47089	88.61173	88.61173	94
5931750	8.522614	97.13434	97.13434	99.3
1994500	2.865656	100	100	100

Source: Field Survey 2017



Source: Field Survey 2017

ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77



Source: Field Survey 2017

CONCLUSION AND RECOMMENDATIONS

This study revealed that male dominated the farming activities in the study area. Majority of the respondents were small scale farmers with production at subsistent level. The study also revealed that most of the respondents were married with experience in farming. Majority of the respondents were educated. The result reveals the overall Gini index among the food crop farmers in the study area as relatively high, which implies that the income disparity is high among them.

Based on the findings of these study the following recommendations were made:

1. Agriculture led growth policy should be encourage because it has the potential of boosting the income of the poor and thus reducing inequality. It is therefore, recommended that growth development programs should be concentrated where the majority of the poor people are more likely to get their incomes and that will surely have greater impact on poverty reduction.
2. Government and donor agencies should put in place practical and workable policies and programs that will ensure the provision of adequate credit facilities to farmers and make these credit facilities accessible and affordable.

3. Efforts be intensify on the part of government and non-governmental agencies to provide productive technology and infrastructural facilities that will help in boosting the income and livelihood of farmers.
4. Expanding employment opportunities in agriculture and non-farm self-employment where the poor are concentrated is an important growth development strategy which should be adopted. Therefore, incentives aimed at increasing agricultural production in the rural areas as well as providing efficient system of input service delivery and remunerative market prices should be encourage.

References

[1]. Adebayo, A.A. (1999). Climate I (Sunshine, temperature, evaporation and relative humidity) In: *Adamawa State in Maps*, Adebayo, A.A. and Tukur A.L. (eds). Paraclete Publishers, Yola, Nigeria pp3-5.

[2]. Adamawa State MDGs report (2006). Adamawa State Millenium Development Goals Report, UNDP.

[3]. Adinya, I. B., Enya, V.E and Kuye, O. O.(2006) : Structure of Ofatura Market, Obubra Local Government Area of Cross-river State. *Global Journal Agricultural Science.* Vol. 6 No. 1, Pp 55-59.

[4]. Amaza, P.S., Bila, Y. and Iheanacho, A.C. (2006). Identification of Factors that influence Technical efficiency of food crop production in West Africa: Empirical Evidence from Borno State, Nigeria. *Journal of Agricultural and Development in the Tropics 107(2).*139-147.

[5]. Awoke, M.U. and C. Okorji (2005). The Determination and Analysis of Constraints in Resource Use Efficiency in Multiple Cropping Systems by Small Holders in Ebonyi State, Nigeria. *African Developments* **29**(3):22-23.

[6]. Bila, Y. and Bulama, Y. (2004): Structure of Maiduguri Cattle Market in Borno State, Nigeria. *Global Journal of Agricultural Science*. Vol. 4 No 2, Pp 159-164.

[7]. Fasasi, A.R.,(2007) Technical efficiency in Food Crop Production in Oyo State, Nigeria, , *Available online* at http://www.krepublishers.com.

[8]. Gwandi, O., Bala, M. and Danbaki, W.J., (2010) Resource Use Efficiency in Cotton Production in Gassol Local Government Area of Taraba State, Nigeria, *J.Agric. Soc. Sci*., 6:87-90,

[9]. Gwandi, O., Economics of Beniseed (*Sesamum indicum* L.) production in mubi region of Adamawa State, Nigeria, *Unpublished M.Sc. Thesis*, Department of Agricultural Economics and Extension, SAAT, FUT, Yola, Adamawa State, Nigeria, 2012.

[10].NPC (2006). National Population Census, Federal Republic of Nigeria Official Gazette, Vol.94, Lagos.

ISSN: 2348-1358
Impact Factor: 6.057
NAAS Rating: 3.77

[11]. Okereke, O. and Anthonio, Q.B.O. (1988): The Structural Characteristics of the Market for Grains in Eastern Nigeria *Readings in Agricultural Marketing*. Longmans, Nigeria, Pp. 116-124.

[12]. Oladipo Simeon Omotema (2005): Opportunities in Nigerian agricultural sector, Federal ministry of agriculture and rural development Headquarters, Abuja.

[13]. Olayide, S.O. and Olayemi J.K. (1998). "Economic aspect of agricultural and nutrition". A Nigerian case study.

