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Measuring Socioeconomic Status of Rural Households in Edo State, Nigeria: An Asset-Based Approach

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Abstract

Available data on farmers' socioeconomic or poverty status have focused on the use of money-metric measure of income and/or expenditure, an approach that has been criticized. An alternative, proposed to assessing households' welfare has been to use asset indices; unfortunately, there is dearth of such study in Edo state. This study therefore assessed the socioeconomic status (SES) of farming households in Edo state, Nigeria based on asset formation. Data were collected by means of questionnaire from 394 respondents, randomly selected from the (3) agricultural zones in the state. The data were analyzed using the households had high socioeconomic status (i.e. non-poor), 49.87% were moderately asset index. Using asset indices as a proxy for poverty, the study established that 36.64% of poor while 13.49% were very poor. However, the level of households' asset formation was constrained by several factors. The study therefore recommended expanding credit allocation to farmers, improving road networks, establishing more agricultural extension contacts with farmers and encouraging the latter to adopt improved farm practices.

1. Introduction

Rural poverty reduction is an increasingly important issue in Africa and is central to achieving the Sustainable Development Goals (SDG). More than one – third of the world's extreme poor live in Sub-Saharan Africa (SSA), a region where the number of poor people rose steadily and dramatically between 1981 and 2011. It is estimated that 49.59% of SSA's population lives on less than one dollar a day (World Bank, 2015).

Rural household farmers are the economic backbone in Sub – Saharan Africa. Unfortunately, these farmers generally lack key resources to face challenges and opportunities occasioned by global food system restructuring (FAO, 2017). In fact, the World Bank estimates that 51.49% of the world poor gets their income from agriculture as a means of livelihood (World Bank, 2015). As a result, it could be claimed that agriculture is a key sector for intervention for people to get out of poverty (FAO, 2017). Rural poverty remains the predominant form of human deprivation in the world and affects many lives in both the developed and the developing worlds. Since the turn of the 21stcentury, one of the major challenges facing most emerging and transitional economies, including Nigeria, is poverty. Another challenge is inadequate access to productive land due to poor land management and cropping practices, declining soil fertility, high population, erratic rainfall patterns and limited water storage capacity for irrigation coupled with rudimentary technology resulting in low yield (Butler and Mazur, 2007).

Many of the farmers are constrained to produce food at subsistence level (Halmen and Hyden, 2011). Thus, inadequate access to assets (land, agricultural equipment, inputs, technical information, and livestock), poor infrastructure, weak market information and institutions limit rural household's access to emerging market opportunities. Ineffective government is blamed for SSA's declining capacity to feed its growing population. However, development partnerships with social institutions such as Non – Governmental Organisations (NGOs), and Community – Based

Organisations (CBOs) have begun to play key roles in supporting farming livelihood of rural households. McCullough et al. (2008) pointed out that to help link these householders with modern market chains, organisations should provide extension services, build markets and transportation infrastructure, strengthen farmer's social network and mitigate information asymmetry with technical assistance, asset building and capacity development of farmers groups.

Nigeria is an "Agriculture – based" country in which agriculture is dominated by rural farmers who produce most of the crops and livestock's products (Salami, Kamara and Brixiova, 2010). With the estimated population of 198 million (World Bank, 2018), Nigeria's widespread poverty is concentrated among rural farming household. Many of them lack access to productivity – enhancing inputs, suffer from heavy produce losses due to pest and diseases, lack of knowledge and specialized skills, have low capital and limited access to credit, face poorly functioning produce markets and lack efficient storage technology. Consequently, agricultural productivity across the country remain low, leading to low overall aggregate agricultural production (Ani, 2004). Many households cannot obtain sufficient food and income from farming alone, thus do off – farm work to compensate the low farming income (Butler and Mazur, 2007). Inadequate agricultural inputs, equipment, technical training, inadequate basic infrastructure e.g. roads, health, education and water supply has serious implications on rural welfare and persistence of poverty in Africa and Nigeria in particular; and these have impeded household farmers' access to modern market opportunities (Alaba, 2013). Literature has shown that majority of rural farmers in Nigeria are poor, implying that they have poor asset base that cannot adequately sustain them (Akpan et al., 2016).

The strong correlation between poverty and assets ownership (IFAD, 2015) indicate the overwhelming need to assess the asset profile of rural households. Household livelihood options are influenced by the access to bundle of assets owned by it. According to Barrett et al. (2016), the amount of assets owned by the household is critical for escaping chronic poverty and/or reducing food insecurity. However, Hallegatte et al. (2020) reported that any negative impact on household assets threatens their long-term subsistence as their ability to cope with the consequent shocks is greatly reduced.

Rural households in Africa are resource poor hence, live vulnerable livelihoods (Ellis and Freeman, 2007). From livelihood perspective, assets formation is the result of access to livelihood activities that allow people to live (Patel et al., 2015; Oni and Fashogbon, 2012). Mckay (2009) noted that the limited level of assets owned by households, plus severe constraints in being able to manage these effectively, are major contributors to the high level of vulnerability as well as persistent poverty in Africa, and among rural households in particular. Nigeria and Edo State in particular, is not exempted. Evidence abounds that assets have not been sufficiently built by Nigeria farmers, hence their high poverty profile. This makes it difficult for them to resist shocks, stress and make them vulnerable to unforeseen difficulties. The number of people in Nigeria increases from 112million yearly to 167 million (representing 67.1 percent) of the total population of 198 million (National Bureau of Statistics, NBS, 2016). This raises serious concern about the welfare or asset ownership structure and socio-economic status among rural farming households in the country and in Edo State in particular. It is this question that this research seeks to answer.

Theoretical background

This study is guided by the sustainable livelihood framework. The sustainable livelihood approach (SLA) has been a dominant approach used by major international agencies in the implementation of development interventions (Morse, McNamara and Acholo, 2009). "A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term." (Chambers and Conway, 1992, page 7, cited by Meikle, Green-Pimentel & Liew, 2018). The definition is conceived in terms of the ability of a social unit to enhance its assets and capabilities in the face of shocks and stresses over time.

The framework is anchored on five major categories of livelihood assets, which are interconnected and shows that livelihoods depend on a combination of assets of different kinds and not just one asset type. An important part of the analytical framework is that is seeks out people's access to different types of assets (social, physical, financial, human, natural) and their ability to employ these in productive uses (Kranz, 2001).

The framework provides three insights into poverty. The first is that though economic growth is crucial for poverty reduction, this does not imply an automatic relationship between the two as it depends on the capabilities of the poor to take advantage of expanding economic opportunities. Secondly, there is the realization that poverty, from the perspective of

the poor, is not simply a question of low income, but also includes other dimensions such as poor health, illiteracy, lack of social amenities or services, etc., as well as a state of vulnerability and feelings of powerlessness. Thirdly, it is now realized that the poor themselves are often aware of their condition and needs and must therefore be engaged in policy design and project targeted at improving their situation (Krantz, 2001).

The idea of assets is a cardinal part of the sustainable livelihood's framework. The framework does not just see poverty as simply a lack of income, but rather considers the assets that poor people require in order to sustain a minimum living. Five principal assets are presented in the framework, which also this study adopts. Five types of assets are described in literature (Udoh, Akpan & Uko, 2017). These include: Human capital: such as skills, knowledge, and good health; Social capital: the social resources that people draw on to make a living, e.g. social networks or membership of groups or organisations; Natural capital: these are natural resource stocks that people can draw on for their livelihoods, e.g. land, forests, water, air; Physical capital: the basic infrastructure that people need to make a living, as well as the tools and equipment they use. Examples include shelter, domestic utilities, transport and communication systems, water and energy; Financial / economic capital: e.g. savings, access to financial services, and regular inflows of money.

The overall aim of the study is to estimate the socioeconomic status (SES) of farming households in Edo State, Nigeria. Specifically, the study employed the asset-based approach in determining the socioeconomic status (SES) of the households.

2. Materials and methods

This study was domiciled in Edo State, Nigeria. The State has a land size of 19,794km2. It lies between latitude 05o and 44o and 07o, 34o North of the equator and longitude 06o 04o and 06o 43o East of Meridian. The 2006 national census puts the state population at 3,233366 (NBS, 2016); however, using the national growth rate of 3.2% per annum, the projected figure for 2020 is 5,002,034. The administrative structure of Edo State consists of the following senatorial zones: Edo north, Edo South and Edo Central. These zones accommodate 18 Local Government Areas or councils.

This research is essentially quantitative and exploratory in its design and procedure. This study adopted the survey design, which allows the researcher to seek information from a population using a sub-set of the population.

Although, Omoregbe and Ajayi (2009) estimated the population of farming households in State to be about 180,000, the sampling procedure was guided by the population of registered farmers with the Edo State Agricultural Development Programme (ADP). The ADP is the public/ government unit charged with the responsibility of managing technology dissemination and training with farming households. Thus, the population of the study comprise farming households in the study area, inclusive of ADP registered or contact farmers and the unregistered farmers. According to the available data from the Edo State ADP, the population of registered farmers is 436 (Edo State ADP Zonal Headquarters, 2017). Based on this population, the estimated sample size, using the formula (Smith, 2013) below is 208.

$$n = \frac{N}{1+N(0^2)}$$

where: n = sample size; N = population; 02= Level of precision desired (in this study 5% was used)

Multi-stage sampling procedure was used in the selection of the respondents from the study area. For the registered farmers, in the first stage, all the agricultural zones (i.e. Edo South, Edo Central and Edo North) in the State were selected. In stage 2, purposive selection of 50% of the absolute number of the (LGAs) in which the ADP has highest record of registered farmers was taken. Thus, 3 LGAs were selected from Edo Central (Esan central, Igueben & Esan west), Edo South (Ovia northeast, Egor & Orhionmwon) and Edo North (Etsako west, Etsako central & Owan east) respectively, making a total of 9. Stage 3 involved the proportional random sampling of registered farmers from the selected LGAs in each zone. The number of registered farmers in the selected LGAs per zone was 156 in Edo Central ADP zone, 64 in Edo south zone, and 154 in Edo north zone. The sample distribution per zone, was determined using equation below, is distributed as follows: 87 in Edo Central ADP zone, 36 in Edo south zone, and 85 in Edo north zone

$$n_i = \frac{N_i}{N} \times \frac{n}{1}$$

where: n_i= desired sample from each Local Government Area; N_i = population of the Local Government Area (e.g. 51 for Esan Central); N = overall population size of selected LGAs (i.e. 374); n = recommended sample size (i.e. 208)

An equivalent number of non-registered farmers was sampled, making the total sample target 416. In sampling the comparative group, two approaches were adopted; in the first case, two communities were randomly selected from each of the LGAs (Igueben, Egor, Orhionmwon, Etsako central, Owan east, Ovia northeast) from where the

list of registered farmers was small i.e. less than 30 farmers (Achen and Duncan, 1989), whereas, where (Esan central, Etsako west & Esan west LGAs) the registered list was large i.e. above 30 farmers, four (4) communities were randomly selected from the LGAs.

Primary data was collected directly from the respondents, with the aid of validated questionnaire and analyzed using descriptive statistics (frequency, percentages, mean) and the socioeconomic status (SES) index.

Operationalization of variables:

(i) Asset Ownership: The available assets owned by farming household was measured by asking respondents to indicate from a list, the assets owned, and this was coded as '1' for Yes or '0' for No. These assets were categorized, based on the sustainable livelihood framework (Krantz, 2001) adopted in this study, as follows: human capital asset (knowledge/skills), physical capital, and social capital, financial capital and natural assets.

(ii) Determination of Socio-Economic Status (SES) Using Asset Index: The study employed principal components analysis (PCA) to generate household asset-based proxy wealth indices. Direct measurements (i.e. income, expenditure, and financial assets such as savings) and can be expensive to collect and may require complex statistical analyses that are beyond the scope of many population health studies (Filmer and Pritchett, 2001, Onwujekwe, 2006). In developing country settings, large seasonal variability in earnings and a high rate of self-employment, together with potential recall bias and false reporting, may render such data inaccurate or even unreliable. Thus, there has been a strong inclination to deploy indirect or proxy measures in estimating household socio-economic status. Proxy measures are considered more reliable, since they require only data collected using readily available household questionnaires supported by direct observation. Also, it has been insinuated that proxy measures might be a more accurate approximations of socio-economic status, as they measure financial stock ('permanent income') rather than flow ('current income'), and hence are less prone to fluctuation (McKenzie, 2004, Montgomery, Gragnaloti, Burke and Paredes, 2000, Ferguson, Tandon, Gakidou and Murray, 2002).

To determine households' wealth status using their assets, one approach has been to sum the number of assets in owned by the households (Montgomery et al., 2000), but this assumes that all assets should be weighted equally. However, this approach has been heavily criticized. An alternative has been to develop a system of weighting the values of the assets used in SES estimation. Principal Component Analysis (PCA) is one such method that has been widely adopted by researchers (Balen, McManus, Li, Zhao, Yuan, Tzinger, Williams, Li, Ren, Liu, Zhou and Raso, 2010). Using weights derived through exploratory factor analysis is a more appropriate method of assigning weights to the variables than the more simplistic equal weights method, the complex weighted-by-price-of-item approach or on an ad-hoc basis (Sahn and Stifel, 2003). PCA is a multivariate statistical technique used to reduce the number of variables in a data set into a smaller number of 'dimensions'. In mathematical terms, from an initial set of n correlated variables, PCA creates uncorrelated indices or components, where each component is a linear weighted combination of the initial variables. For example, from a set of variables X1 through to Xn,

$PC1= a_{11}X_1 + a_{12}X_2+\ldots.+ a_{1n}X_n$

$PCm= a_{m1}X_1 + a_{m2}X_2+\ldots.+ a_{mn}X_n$

Where:

amn represents the weight for the mth principal component and the nth variable.

However, for purpose of SES estimation, of interest is the first linear component of the PCA analysis. it is assumed that the first principal component is a measure of economic status (Houweling et al., 2003). Based on the inter-relationship between the set of variables, exploratory factor analysis assigns weights to ownership of the assets. The weights correspond to the factor loadings (eigenvectors) of the first derived variable, and are used to generate an index of relative SES. It is assumed that the first principal component is a measure of economic status (Houweling et al., 2003, Vyas and Kumaranayake, 2006). In this study, the following procedures were followed in the construction of asset-based proxy wealth indices using PCA:

A. Selection of Asset Variables: In other to construct an Asset based index, the first procedure was to identify the set of variables to incorporate or use. In this study, the asset variables used were guided by the livelihood framework (Krantz, 2001) and included the following 'proxy' category measure and indicators: household/ domestic assets with nine (9) indicators, five (5) social asset indicators, six (6) human asset indicators, four (4) financial / economic asset indicators, six (6) farm asset indicators and three (3) natural asset indicators. These gave a total of 33 asset variables (Table 1).

B. Dichotomization of variables: The second stage was the transformation of the data into dummy or binary data set. According to Vyas and Kumaranayake (2006) and Balen et al. (2010), categorical and continuous data are not suitable for PCA, as the categories are converted into a

quantitative scale which does not have any meaning. Most of the asset data in this study were binary (see Table 1). However, few (i.e. five) were categorical, and these were transformed into binary variables as noted in the table 1.

C. Assessment of the mean or frequency distribution of selected assets: According to Vyas and Kumaranayake (2006), assets which all households own or which no households own would exhibit no variation (i.e. zero standard deviation) between households and would be zero weighted, and so of little use in differentiating socio-economic status. Thus, descriptive analysis (frequency or mean distribution) needs to be carried out on the data. In this study, preliminary analysis (frequency distribution or means) revealed a set of variables had no variability in frequency (i.e. response) across the respondents. These were ownership of cutlass, hoes and plough/tractor; all the respondents possessed or owned the former (i.e. cutlass and hoes) while no one had the latter. These three (3) variables were therefore dropped from further analysis.

Table 1. Measurement level of asset variables

Assets	Measurement Level	Variables Transformed	Assets	Measurement Level	Variables Transformed
Domestic Asset			Farm Assets		
Radio / Television	Binary		Spade/Shovel	Binary	
Transport means (bike, car, bus)	Binary		Hoe	Binary	
Fan	Binary		Cutlass/ Matchet	Binary	
Generator	Binary		Watering can	Binary	
Furniture (Cushion chairs)	Binary		Plough or Tractors	Binary	
DVD or Video player	Binary		Agro chemicals etc.	Binary	
Refrigerator/Fridge	Binary		Natural Assets		
Do you have any building or residential housing?	Binary		Farmland		
G.S.M Phone	Binary		Livestock	Binary	
HUMAN ASSETS			Farm size (range)(ha)	Binary	Small; large
Do you have any household member contributing to the household income apart from you?	Binary		Social Assets		
Have you undergone any training on modern farming methods in the last 3 years?	Binary		Are you a membership of cooperative group?	Binary	
Highest Education	Categorical	Low; High	Do you belong to any farmers' organisation?	Binary	
Farming experience (range)	Categorical	Low; high	Have you at any time occupy any leadership position in your group/ association?	Binary	
Number of labourers employed on farm in the last one year?	Binary		Do you have any relatives and friends that can support you with finance/capital when in need?	Binary	
How will you rate your health status in the last one year?	Categorical	Poor; fair	How often do you participate in the associated activities?	Categorical	Low; moderate
			Financial / Economic Assets		
Have you benefitted capital from any government agency in the last five years?	Binary		Did you earn income from non-farm activities in the last one year?	Binary	
How will you describe your savings in the last one year?	Categorical	No savings; have savings.	Have you ever obtain loan from any of the financial or banking institutions in the last five years?	Binary	

Table 2. Factor loadings on asset variables using PCA

Asset variables	coefficients (factor loadings / weight)	Mean	SD
Radio / Television	0.380	0.939	0.24
Transport means (bike, car, bus)	0.624	0.819	0.39
Fan	0.585	0.847	0.36
Generator	-0.638	0.229	0.42
Furniture (Cushion chairs)	0.448	0.715	0.45
DVD or Video player	0.517	0.784	0.41
Refrigerator/Fridge	0.641	0.748	0.43
Do you have any building or residential housing?	-0.538	0.351	0.48
G.S.M Phone	0.353	0.926	0.26
Are you a membership of cooperative group?	0.467	0.690	0.46
Do you belong to any farmers' organisation?	0.563	0.672	0.47
Have you at any time occupy any leadership position in your group/ association?	0.273	0.455	0.50
Do you have any relatives and friends that can support you with finance/capital when in need?	-0.071	0.387	0.49
Participation in association (dummy)	0.355	0.237	0.43
Do you have any household member contributing to the household income apart from you?	0.058	0.641	0.48
Have you undergone any training on modern farming methods in the last 3 years?	0.460	0.550	0.50
Educational status (dummy)	-0.162	0.188	0.39
Farming experience (dummy)	-0.206	0.524	0.50
Number of labourers employed on farm in the last one year?	-0.013	0.527	0.50
Health status (dummy)	-0.201	0.293	0.46
Did you earn income from non-farm activities in the last one year?	0.171	0.580	0.49
Have you ever obtain loan from any of the financial or banking institutions in the last five years?	0.412	0.603	0.49
Have you benefitted capital from any government agency in the last five years?	0.488	0.628	0.48
Savings status (dummy)	0.307	0.374	0.48
Spade/Shovel	0.433	0.837	0.37
Watering can	-0.572	0.300	0.46
Agro chemicals etc.	0.422	0.639	0.48
Farmland	0.489	0.728	0.45
Livestock	0.105	0.262	0.44
Farm size (dummy)	0.077	0.443	0.50

Source: PCA computation from survey data.

Subsequent frequency or mean analysis of the assets ownership status revealed a minimum and maximum values 0.19 (i.e. 19%) and 0.94 (i.e. 94%). A standard practice in the use of PCA in asset index construction is to drop variables with very low frequency e.g. Vyas and Kumaranayake (2006), in their study, expunged variables with means less than 0.01 (i.e. 1% of the total). The minimum percentage obtained in this study was 19%, hence the researcher saw no need to drop or expunge any other variables from the PCA analysis.

D. PCA Analysis: PCA was used to analyze the unstandardized asset data using SPSS. The output from the PCA is a table of factor scores or weights for each variable (Table 2). Generally, a variable with a positive factor score is associated with higher SES, and conversely a variable with a negative factor score is associated with lower SES.

E. Determination of asset Index: The PCA loadings (which constitute the weights) on the first component matrix were then used to compute standardized indices of relative household wealth, using the following equation:

$$Aj = \sum_{i=1}^{n} f_i(a_{ji} - a_i) / S_i$$

Or

Aj = fi * standardized variable

Or

Aj = f1*[(aj1-a1)/(s1)]+…+ fn*[(ajn - an)/(sn)]

where

Aj = is the standardized asset index for each household (j =1,…….,n)

fi = the scoring factor (factor loadings or weights) for each asset of household (i =1,……,n)

aji = the ith asset of jth household (i ,j =1,……,n)

ai = the mean of ith asset of household (i =1,……,n)

si = the standard deviation of ith asset of household (i =1,……,n)

In the above formula, each of the asset variables is first standardized since they have different measurement units. Standardization ensures all the variables are transformed to similar units. Each of the standardized asset variables per household is then multiplied by its corresponding weight or factor loading (i.e.fi) derived from the PCA. The results are summed to get the total Asset Index score for each household.

F. Normalization of asset index: After summing the indices on each of the assets from the above equation for each respondent, the resulting value (i.e. the aggregate standardized asset Index score) is now normalized using the formula below. This ensures all the computed values range between 0 and 1.

$$Normalized\ Score = \frac{(\text{Respondent Index score} - \text{Min or lowest index score in data set})}{(\text{Max or highest index score} - \text{Minimum index score})}$$

G. Classification of respondents: In other to categorized respondents into distinct SES classes or categories, the study adopted the approach proposed by Filmer and Pritchett (2001) and Gwatkin et al. (2000). Cut-off points were used to classify the lowest 40% of households into 'poor', the highest 20% as 'rich' and the rest as the 'middle' group (Filmer and Pritchett, 2001), or the division of households into quintiles (Gwatkin et al., 2000). On this basis, the asset index score of the respondents were employed in classifying the first 20% into rich, followed by middle 40% and bottom 40%, which also represents the rich, middle income and poor respectively.

3. Results and discussion

Domestic assets owned by households.

The distribution of respondents based on ownership of domestic assets is presented in Table 3. The results showed the most common domestic asset owned by the farming households were radio/television (93.89%), GSM phone (92.62%), fan (84.73%), transport means (bike, car and bus (81.93%), DVD or video player (78.37%), refrigerator/fridge (74.81%), and furniture (cushion chairs) (71.50%). The least owned assets were personnel building or residential and generator representing 35.11% and 22.90% respectively.

This result suggests a high level of ownership of domestic assets by the respondents (mean = 70.65%), and may suggest some level of economic endowment among the farming households. This view draws from Hassan and Babu (1996) and Amaza et al. (2009) findings that the level of asset ownership is an indicator of an household or individual endowment and resilience in terms of food crises, resulting from famine, crop failure and natural disasters.

Table 3. Domestic assets owned by respondents

Assets	Freq*	%
Radio / Television	369	93.89
G.S.M Phone	364	92.62
Fan	333	84.73
Transport means (bike, car, bus)	322	81.93
DVD or Video player	308	78.37
Refrigerator/Fridge	294	74.81
Furniture (Cushion chairs)	281	71.5
Own any building or residential housing	138	35.11
Generator	90	22.9
Mean (%)		70.65

*Multiple responses

Social assets owned by households

In terms of social assets owned (Table 4), the results revealed 68.96% of the respondents belonged to cooperative groups, 67.18% were members of farmers organisation, 23.66% participated moderately in their group activities, 45.55% had served in leadership positions in the groups and 38.68% had relatives/friends that can support them with finance when in need.

Table 4. Social assets owned by respondents

Assets	Options	Freq**	%
Membership of cooperative group	Yes	271	68.96
Member of farmers' organisation	Yes	264	67.18
Have occupied leadership position in association	Yes	179	45.55
Have relatives / friends that can support you with finance when in need	Yes	152	38.68
Participation level in association*	Low	300	76.34
	Moderate	93	23.66
Mean %			48.81

*High and moderate were classified as moderate; none & low were classified as low

**Multiple responses

The above result indicates that the level of social asset ownership among farming households in the study area was about average (49%). Social assets offer mechanism for people to help each other in times of need and solve internal problems collectively. Butler (2007) and Chamber (1992) asserted that being a member of social group can enhance the farmers' access to information, credit and ability to solve problems collectively. Furthermore, they maintained that members of an organisation are at an advantage with respect to other farmers, in terms of their access to information on improved technologies. Membership of any organisation is expected to link the individual farmers to a larger society and expose the farmers to a variety of ideas, which can enhance asset formation.

Human Assets Owned by Respondents

Table 5 shows 81.17%, of them had low formal education, 29.26% rated their health status as fair, 64.12% had a household member that contribute to household income, 54.96% had undergone farm training, 47.58% had low farming experience, 52.67% employed / hired labour to support their farm enterprise activities, while only 18.83% had high formal education. The mean percent for human asset ownership is 50.49%, suggesting a relatively moderate ownership of human assets, which can enhance their socioeconomic status. This finding lines up with that of Morse et al. (2009), who indicate that human capacity (knowledge and labour or the ability to command labour) required to make use of other form of assets is not sufficient among farming households in his study area.

Financial / economic assets owned by respondents

Table 6 shows 58.2%, of the respondents earned income from non-farm activities in the last 5 years,60.31%accessed loan in the last 5years, 62.85% had benefitted capital from government agency in last 5 years, while 62.60% represents respondents who had no savings. These results suggest the level of financial/economic asset ownership was moderate since more than half (54.46%) of the respondent affirmed in the positive regarding three of the four asset variables considered in this section. The mean percent was computed based on the percent positive response to the variables under consideration i.e. those who claimed to possess these assets. This finding line up with that of Moser (1998), who indicate that financial asset is needed to acquire physical assets and it is basically the facilitator of production. He also maintained that financial asset also defined the status of social asset among farming households, as innovations are bought or possess with the help of the family's financial asset.

Table 5. Human assets ownership by respondents

Assets	Options	Freq	%
Other household members contribute to household income	Yes	252	64.12
Undergone any training on modern farming methods in last 3 years	Yes	216	54.96
Educational status (dummy)	Low formal education	319	81.17
	High formal education	74	18.83
Farming experience (dummy)	Low (<=19 years)	187	47.58
	High (>20yrs)	206	52.42
Labour employment status	Employed no labour	186	47.33
	Employed labour	207	52.67
Health status (dummy)	Poor	278	70.74
	Good	115	29.26
Mean %			50.49

Table 6. Economic assets owned by respondents

Assets	Options	Freq	%
Earn income from non-farm activities in last year	Yes	228	58.02
Assessed loan in the last 5 years	Yes	237	60.31
Have benefitted capital from government agency in last 5 years	Yes	247	62.85
Savings status (dummy)	No savings	246	62.6
	Have savings	147	37.4
Mean %			54.65

Farm assets owned by respondents

Table 7 shows that all the respondents had hoe/cutlass, 83.72% had spade/shovel, 63.87% had agro-chemicals, while only 30.3% claimed to have watering can. The level of farm asset ownership was high (mean percent = 62.94%) except for plough and tractors. This finding line up with that of

Antonopolous (2005), who suggested that ownership of farm assets can help farmers in their farm operations. He maintained that poverty is more prevalent in households without assets than asset-owning ones.

Table 7. Distribution of respondents based on ownership of farm assets

Assets	Response	Freq	%
Hoe	Yes	393	100
Cutlass/Matchet	Yes	393	100
Spade/Shovel	Yes	329	83.72
Agro-chemicals etc.	Yes	251	63.87
Watering can	Yes	118	30.03
Plough or Tractors	Yes	0	0
Mean %			62.94

Natural assets owned by respondents

Table 8 shows 72.77% of the respondents had farmland, 26.21% had livestock, while 55.73% had farm size of less than 2ha. The mean percent result suggests the level of natural assets ownership among the households was less than moderate as almost half (47.75%) of them had large farm size and most had / owned farmland. This finding lines up with that of Barbier and Horchard (2014), who indicate that natural capital is the basis of all human economic activity. The authors maintained that a single household asset such as land can generate multiple streams of benefits. They affirmed that households' access to land (natural capital) can also influence their access to financial capital, as they are able to use land not only for direct productivities, but also as collateral to secure loan. Households having large size of land holdings therefore are likely to have good economic condition and good sustainable livelihoods.

Table 8. Natural assets owned by respondents

Assets		Freq	%
Farmland		286	72.77
Livestock		103	26.21
Farm size (dummy)	Small (<2ha)	219	55.73
	Large (>2ha)	174	44.27
Mean %			47.75

Socioeconomic status of respondents

Table 9 shows the distribution of the respondents based on their socioeconomic status as determined using asset ownership index. The result revealed that 13.49% of the respondents were poor with an asset index range of ≤ 0.400, 49.87% were moderately poor with an asset index range of 0.401-0.800, while 36.64% were non-poor with an asset index range of ≥ 0.80.1. The results suggest majority of the respondents were averagely or very poor with only about 36.64% belonging to the non-poor class. This is similar to the observation of Hassan (2010), that farming households were about average or poorer than average in terms of socioeconomic status. This low socio-economic status of the farming households makes them highly vulnerable to poverty.

Table 9. Socioeconomic status of respondents

Status (index range)	Freq	%
Poor (≤ 0.400)	53	13.49
Moderately Poor (0.401-0.800)	196	49.87
Non-Poor (≥0.801)	144	36.64
Total	393	100.00

4. Conclusions and recommendations

Based on the results of the study, the researcher concludes as follows: farming households in the study area owned several assets that cuts across domestic, social, human, financial and natural assets. Based on the asset possessed, about half (49.9%) of the farming households were classified as moderately poor. Based on the findings of the study and to improve farmers' socio-economic status through asset formation, the following recommendations are made.

Farmers should be encouraged by relevant stakeholders to participate in cooperative activities to enhance their access to capital for enterprise investment. The farmers could be to link to credit institutions to further enhance their access to more capital that will help increase their farm enterprise investment and asset accumulation.

Training should be organized for farmers by the relevant stakeholders such as the extension agency, to improve their technical skill in use of farm technologies.

ADP should make concerted efforts to reach out to farmers with extension services. More farmers can be registered by the organization, while farmers' group can be contacted with agricultural extension information. The farmers should be encouraged to adopt improved farm practices to increase productivity.

The relevant agency such as ADP should direct farmers where they can have their incentives such as improved varieties; this will improve their productivity, enhancement of income for asset formation.

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