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Rural Livelihood Improvement: An Assessment of Household strategies And Activities in Adamawa State, Nigeria

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Abstract

The livelihood of rural residents is paramount in the development of the Nigerian State. The broad objective of this study was to assess rural livelihoods in Adamawa State, Nigeria. In specific terms, the study described rural residents' socio-economic characteristics, identified their livelihood strategies and activities, examined factors affecting the undertaking of diverse livelihood activities, and also identified livelihood constraints in the study area. A multistage sampling technique was used to collect primary data from 480 selected household heads spread across 16 villages from the three agro-ecological zones of the State. Descriptive statistics and Ordinary Least Square (OLS) regression analysis were used in the data analysis. Findings of the study revealed that most of the respondents were male with a mean age of 46 years and were mostly (over 60%) educated. Married persons constituted the majority (about 90%), having an average household size of the respondents was seven persons. The main livelihood strategies in the area were diversification, intensification, and migration with agriculture-related activities being the most common. The study also revealed that the livelihood activities in the area were significantly affected by age (X_1), gender (X_2), marital status (X_3), household size (X_4), educational level (X_5), farm size (X_6), remittance (X_7), social group membership (X_8), and access to credit (X_9). The respondents' foremost livelihood constraints identified in the study were the lack of basic social amenities, poor political representation, insecurity challenges, lack of capital/financial exclusion, and adverse climatic conditions. Key among the recommendations of the study was the need for substantial investments in the provision of physical infrastructure in rural areas and also the provision of adequate security of lives and properties in conflict-affected areas.

Keywords: rural livelihood, strategies, activities, Adamawa State, Nigeria

1.0 Introduction

Securing adequate livelihoods for rural residents has remained a huge challenge for most developing nations across the globe, particularly Nigeria. These rural areas contribute substantially to the overall development of the nation through the supply of food, raw materials for agro-allied industries, surplus labour, and markets for goods produced in other sectors of the economy, among others (Muhammad, Yaseen, & Shakeel, 2017). The Nigerian rural space holds about 53% of the nation's population (United States Agency For International Development [USAID], 2015). However, in some parts of the country, the rural space holds more than this proportion. In Adamawa State, over three million people reside in rural areas, and their livelihood depends mostly (80%) on agriculture (Adamawa State Government, 2016; Food and Agriculture Organization [FAO] & International Crops Research Institute for the Semi-Arid Tropics [ICRISAT], 2019). Achieving a sustainable rural livelihood is an essential element at the root of all human development and economic growth (Barad, Fletcher, & Hillbruner, 2020). A livelihood refers to the way people combine and use their assets, capabilities, and undertake activities to secure a means of living (Krantz, 2001; Ellis & Allison, 2004). Rural livelihoods are a long-term adaptation to, and exploitation of, natural resources within an overall economic, social, and political context, both local and national. Therefore, individuals respond to changes in these contexts over time (Famine Early Warning Systems Network, 2018).

Undertaking agricultural activities being the most prominent livelihood activity of rural dwellers of Adamawa State is being impaired by various environmental, social, economic, and political factors (Adebayo, Onu, Adebayo, & Anyanwu, 2012; Michael, Lumbonyi, Abdullahi, Olayiwola, Yaduma, & Abdullahi, 2016; Olomola & Nwafor, 2018; Sakiyo *et al.*, 2020). Prominently, the challenge of climate change has affected farming activities drastically (FAO and ICRISAT, 2019). According to Sakiyo, Musa, and Badgal (2020), in most parts of the State, rural residents exploit forest resources through deforestation (for farming and logging) and also hunting of games without taking any conservation measures. These activities over time have depleted forest resources considerably, thereby posing a huge livelihood challenge to communities relying on the forest resources for sustenance. In the same vein, the livelihoods of fishing communities are being threatened by unregulated fishing activities (Linus, Amos, Michael, & Michael, 2014). Accordingly, the water bodies are currently inadequate in sustaining the livelihoods of the fishers since income from fishing has drastically reduced. Similarly, Kwabe, Bosco, Acinta, and Tumushabe (2018) reported that in riparian communities, grazing along the banks had affected fishing habitats leading to low fish production; also, the recreational and cultural potentials of such communities are affected. Furthermore, flooding has remained a common occurrence in fishing communities resulting in the loss of livelihoods and even lives in some instances (Michael *et al.*, 2016; FAO & ICRISAT, 2019). According to the FAO (2020), Adamawa state over the years has demonstrated high vulnerability and low adaptive capacity to the effects of climate change, particularly dry spells, erratic rainfall, and floods.

Another serious livelihood challenge for rural communities in the State is the high incidence of conflicts. These recurrent conflicts have become a very serious social concern, considering their effects on livelihoods by depleting productive assets, thereby causing poverty (Samuels, Gavrilovic, Harper, & Niño-Zarazúa, 2011). In the last two decades, Adamawa State underwent about 200 conflicts of various forms (World Bank, 2016; Institute for Economics &

Peace, 2019). According to the International Crisis Group (2018), the farmer-herder conflicts in recent years have destroyed lives and properties in some areas beyond the quantum of damages done by the dreaded Boko-Haram insurgent group. In some parts of the State, such conflicts have succeeded in heightening ethnic and religious tensions leading to displacement or migration of people (United Nations Office for West Africa and the Sahel, 2018). The International Crisis Group (2018) also asserted that the conflicts' roots lie in climate-induced degradation of pasture and population explosion leading to the expansion of farmlands and housing way into the grazing reserves, which has served as routes for pastoralists over the years. These incessant conflicts have caused the loss of lives and properties across the divide.

Similarly, communities in northern and some communities in the central parts of the State have been facing heightened security challenges due to the Boko-Haram insurgency (Tari, Kibikiwa, & Umar, 2016). According to Youth Employment and Social Support Operation [YESSO] (2016), Adamawa State lost about US\$ 1.6 billion in assets due to the insurgency. This negative effect of the Boko Haram insurgency in North-East Nigeria continues to be a source of worry to all and sundry due to the humanitarian crisis these areas have faced (Meagher, 2014; World Bank, 2016; International Organization for Migration [IOM], 2019). In specific terms, the insurgency has substantially affected agricultural activities and also destroyed physical infrastructures in the area (Augustine et al., 2019). Consequently, both farmers and herders feel threatened to move about freely in these communities leading to significantly below-average production. Equally, as a result of both the insurgency and counter-insurgency measures in the area, a large proportion of physical and economic infrastructures (especially roads, markets, electricity, and banks) were damaged in these areas. It should be noted that in terms of physical infrastructures, the rural parts of the State were notable for being among the weakest and way below the national average set as a benchmark in the country (African Institute for Applied Economics [AIAE], 2007). The poor state of rural roads has reduced the capacity of farmers to transport agricultural produce and other economic goods from one part of the State to the other. Also, in these communities, there is a near absence of financial institutions, thereby limiting residents' ability to access financial services that can improve their livelihoods.

The multiple scourges of climate change, farmers/herders' conflicts, and insurgency have worsened the livelihoods of rural residents in Adamawa State, and this constitutes a serious policy concern. The State's income poverty had consistently increased from 64.2% in 2004 to 75.4% in 2019 (NBS, 2012; World Bank, 2016; National Bureau of Statistics, 2020). Also, 54% of the State's population is multidimensional poverty, which implies very low human development credentials (Oxford Poverty and Human Development Initiative [OPHI], 2019). According to Barrett, Bezuneh, & Aboud (2001), when agricultural activities become inadequate to support livelihoods and poverty pervades, people are pushed into diversification by increasing income-earning activities. In Adamawa State, the government, in collaboration with other development partners, has committed substantial resources in rebuilding and also improving livelihoods. To achieve this, interventions in various forms ranging from peace-building, provision of physical infrastructure (like roads, hospitals, and schools), training of farmers, and the provision of farm inputs, among others, were initiated to give people a range of alternatives to achieve their livelihood goals (United Nations Development Programme, 2016; YESSO, 2016; FAO, 2020). Therefore, there is a need to understand rural livelihoods to adequately guide and promote evidence-based policy decisions

on rural development in the state (FAO, 2014; Khatiwada, Deng, Paudel, Khatiwada, Zhang, & Su, 2017). Hence, the broad objective of the study was to examine livelihood strategies and activities in rural parts of Adamawa State, Nigeria. The study's specific objectives were to:

- describe the socio-economic characteristics of rural household heads;
- identify the livelihood activities and strategies of the respondents;
- assess the factors affecting the livelihood activities of the respondents; and
- identify the livelihood constraints of the respondents.

2.0 Scholarly Context

The concept of a sustainable livelihood approach (SLA) or framework (SLF) has over the last three decades occupied the front burner in most rural development discussions and practices in a bid to understand people's living conditions and identify channels of improvements (Scoones, 2009; Urs, Müller-Böker, Shabaz, Steimann, & Thieme, 2011; Carr, 2013). Livelihood is a multidimensional phenomenon that considers people's resources and constraints they face in meeting their needs Chambers, 1992; Muhammad et al., 2017). The approach considers people as actors having certain livelihood goals based on capabilities, assets, and activities (Chambers, 1992; Ellis, 2000; USAID, 2015; Scoones, 2009). The assets individuals rely on could be natural, physical, human, financial, or social. Access to these resources is greatly influenced by social relations and institutions (DFID, 1999; USAID, 2015; Adger, 2006). In order to meet the set livelihood goals, individuals undertake various livelihood strategies (Scoones, 1998). Agricultural intensification/extensification entails the reliance on farming or other farm-related activities to earn a living. This could be achieved by increasing farm outputs per unit area or increasing farmlands to boost output. Livelihood diversification is about undertaking a wide range of income-generating activities to reduce risk and vulnerability and stabilise income and consumption (Ellis, 2000). It involves undertaking both farm and non-farm activities. Also, people migrate on a temporary or permanent basis as a livelihood strategy. This is done when conditions in a particular location do not lead to the desired livelihood outcome, hence the need to move to other places.

According to Chambers and Conway (1991), the sustainable livelihood concept is about enhancing capabilities and assets to withstand shocks and stresses over time without undermining the environment where natural resources are based. The Department for International Development [DFID] (1999) framework classified livelihood assets into five classes: (1) human capital, which has to do with skills, knowledge, and labour; (2) financial capital that deals with people's income, savings, and remittances, among others; (3) social capital that encompasses formal and informal networking capacity, and access to services; (4) natural capital has to do with the climate, quality of land, water resources, and vegetation; and (5) the physical capital, which has to do with adequacy of basic utilities. According to Carney (1999), these assets are harnessed by individuals or households through the adoption of strategies and activities in order to achieve certain livelihood goals. The adoption of a particular livelihood strategy gives an outcome that could be positive leading to more resilience or negative causing increased vulnerability (Sen, 1999; Bedeke, 2013; Davies, Béné, Arnall, Tanner, Newsham, & Coirolo, 2013). The choice of a livelihood strategy to be adopted by an individual or household is

influenced by social, economic, environmental, and political factors (Barrett et al., 2001; Kamwi, Chirwa, Graz, Manda, Mosimane, & Kätsch, 2018). These factors impact the availability of assets and the opportunities to transform those assets into better wellbeing (Ellis, 2000; Abimbola & Oluwakemi, 2013; International Recovery Platform, 2015). The concept of ‘Sustainable Livelihoods’ has been adopted by various development agencies across the globe to meet their needs.

The DFID (1999) Sustainable Livelihood Framework (SLF) was developed to promote livelihoods across various parts of the globe. In designing the framework, the adaptability of the SLF to local contexts was a major consideration; hence, it is flexible and open for changes to be made. According to Kollmair and Gamper (2002), due to this feature, the SLF is being used by various development agencies in identifying development needs based on priorities. This framework is prominently being used in poverty reduction initiatives since it provides a clear view of the various environmental, social, economic, and institutional development pillars in an area. In specific terms, the DFID framework was aimed at supporting asset accumulation to reduce vulnerability, thereby promoting sustainable livelihoods. Despite the lofty potentials of the SLF in understanding the livelihoods of people, some limitations were overserved when adopting the concept. To Kollmair and Gamper (2002), understanding livelihoods should not be limited to temporal dynamics as in the case of SLF, rather historical contexts regarding ecological and socio-economic transformations should be taken into cognisance. Similarly, Saktapolrak (2014) asserted that the SLF has failed to adequately capture the relationship between “structure” and “agency.” In the same vein, the framework’s notion of assets has not been broadened enough to suit all contexts. Therefore, the framework may lack the robustness to adequately capture some livelihood realities.

Similarly, the Centre for Applied Macroeconomic Analysis (CARE) has adopted the livelihood framework as used by Chambers and Conway (1991). Based on this, CARE considers human capabilities, ownership/access to assets, and the undertaking of economic activities as fundamental attributes of livelihoods. In this framework, securing livelihoods through empowerment is paramount. Despite the similarities between the concept being used by CARE and DFID, the CARE concept failed to adequately capture macro and micro links. Similarly, structures and processes that are transformative were not explicitly identified in the framework (Drinkwater & Rusinow, 1999). In the same vein, Oxfam is another development organisation that uses a livelihoods framework that is similar to that of the DFID. The organisation views livelihood sustenance as a right that should be protected. Relying on the livelihood perspective of Chambers and Conway (1991), sustainability encompasses social, economic, institutional, and ecological considerations for policies and program implementation. Furthermore, on a global scale, the United Nations Development Programme (UNDP) has included sustainable livelihoods concepts into its Sustainable Human Development (SHD) mandate. The framework is being used to facilitate poverty reduction initiatives of the institution by focusing on the strength of the people rather than their needs. The framework emphasises the prominence of government policies and the need to adopt technological innovations in improving livelihoods.

3.0 Methodology

3.1 The Study Area

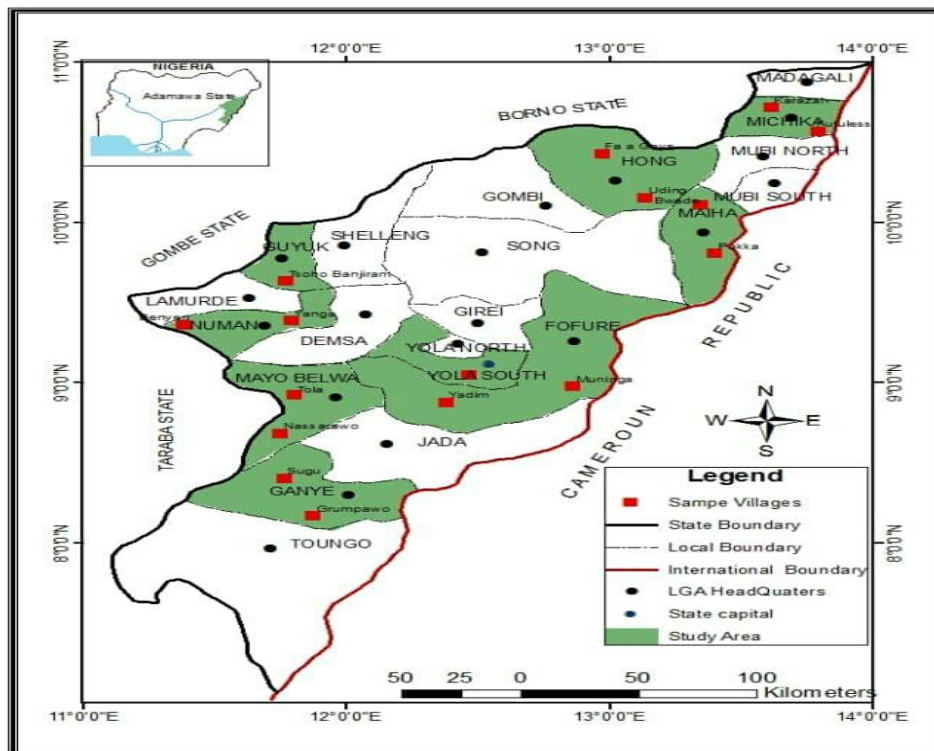
The choice of Adamawa State for this study was informed by the vulnerability of rural households to various livelihood challenges and the need to contribute to the rebuilding of livelihoods of people affected by these challenges. The State lies between latitude 7° and 11° N and between longitude 11° and 14° E (Adebayo, 1999; Adamawa State Government, 2016). The State covers a landmass of about 38,823 km² of which 28,730 km² is arable, having a tropical wet and dry climate (FAO, 2019). The dry season starts mostly in November and lasts till March, while the rainy season is between April and October. The major agro-ecological formation of the State includes the Guinea Savannah, which is divided into Southern and Northern Guinea Savannah, and the Sudan Savannah. Mean annual rainfall is about 1600 mm in the extreme southern part of the State, while in the north to the north-western part of the State it ranges from 700 mm to 1050 mm (Adebayo et al., 2012; Jamala & Oke, 2013; FAO & ICRISAT, 2019). The eastern parts of the State are bordered by the Cameroon Republic, Taraba State is located along the Southern and Western borders, while Gombe and Borno States are along the State's north-western and northern borders, respectively. Politically, the State is divided into three senatorial zones (South, Central, and North) which consist of 21 Local Government Areas (Adamawa State Government, 2016) and has an estimated population of about 4,438,628 million people who are mostly residing in rural areas (FAO, 2016; NBS, 2018). Economically, 70-90 percent of the working-age population in the State are engaged in subsistence farming or other agriculture-related activities (Adamawa State Government, 2016).

3.2 Methods

The study adopted a descriptive survey research design to achieve the research objectives. A semi-structured questionnaire was developed to collect both qualitative and quantitative data for the study. The questionnaire was pre-tested, modified, and implemented within three randomly selected Local Government Areas before the actual survey was conducted.

3.2.1. Sampling and sample size. The study relied on key informants to generate the sampling frame, which was comprised of 1,243,855 rural household heads. In Nigeria, a rural area is a settlement with 20,000 persons or less whose occupations are mainly agrarian and where the people are relatively homogenous in their values, attitudes, and behaviour (Ekong, 2010; Olojede, Adekunle, & Samuel, 2013). A multistage sampling technique was used to select respondents for the study. The three agro-ecological zones of the State were selected purposively in the first stage. From the selected zones, nine Local Government Areas (LGAs) were proportionately selected in the second stage. As shown in Figure 1, a random sampling technique was used to select 16 rural communities from the study area. In the fourth stage, 30 households were equally selected from all the sampled communities; hence, 480 household heads were selected for the study. The respondents selected for the study were adequate to be considered as the representative of the study population at a 5% level of significance using Krejcie and Morgan's (1970) table of sample size determination.

Figure 1. Map of the Study Area.



Source: GIS Laboratory, Department of Geography, MAUTECH, Yola, 2018.

4.0 Analysis

In analysing the data obtained from the study, both descriptive and inferential statistics were used. Descriptive statistics were used to describe the respondents' socio-economic characteristics, identify livelihood strategies and activities, and also indicate the constraint they face in achieving better livelihood outcomes in the area. As used in studies conducted in other parts of the globe (Abdulai & CroleRees, 2001; Nwaogwugwu & Matthews-Njoku, 2015; Liu and Liu, 2016; Kassie, Kim & Fellizar, 2017), the Ordinary Least Square (OLS) regression analysis was used to examine the factors that affect livelihood activities in the area, and the formula is presented as the following:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots + \beta_9 X_9 + U$$

Where:

Y= number of livelihood activities (number)

β_0 = constant

X_1 = age (years)

X_2 = gender (male=1: female=0)

X_3 = marital status (married=1: unmarried=0)

X_4 = household size (number of people)

X_5 = educational level (number of years spent in school)

X_6 = farm size (number)

X_7 = received remittance (yes=1: no= 0)

X_8 = membership of group (yes=1: no= 0)

X_9 = access to credit (yes=1: no= 0)

U= error term

5.0 Results and Discussion

5.1 Socio-economic Characteristics of the Respondents

Socio-economic characteristics are important determinants of livelihoods since they are directly linked to people's assets and position in society (Abbay, Rutten, Azadi, & Witlox, 2019). Table 1 presents the respondents' socio-economic characteristics across the agro-ecological zones of the State. Based on age, the study revealed that the average age of the household heads was 46.35 years. The result implies that across all the zones, the majority of the respondents were relatively young and could afford to adopt various livelihood strategies and activities aimed at improving wellbeing. The result of the distribution of the respondents by sex reveals that the majority (more than 85% in all the zones) of the household heads were male, while the female-headed households were few (below 15% in all the zones). In terms of marital status, the majority (over 89% across zones) were married. The distribution of the respondents by household size (number of persons residing in a household sharing basic consumables) showed that the average household size in the study area was seven persons, which is higher than the regional average of six persons (UNDP, 2016). This implies that the majority of the respondents will have to undertake diverse livelihood strategies and activities to meet the needs of their families since being married comes with certain responsibilities in most rural contexts in the study area. According to Olojede et al. (2013), a rural community cannot foster development without educated people due to the fact that it can contribute significantly to the mobilization and distribution of various capitals. In this study, the distribution of the respondents by educational attainment revealed that the majority (more than 66% in all the zones) of the respondents had acquired formal education, mostly (between 40.7%-50.5%) at the primary school level. As opined by Oni and Fashogbon (2013), farming plays a very significant role in sustaining the economy of rural communities in Nigeria. The distribution of the respondents according to their farm size (the land area being used for farming activities) shows that the mean farm size of the respondents was 2.48 hectares. This finding indicates that farmers in the study area were mainly small-scale farmers. This finding corroborates with those of Arene and Anyeaji (2010) and Oni and Fashogbon (2013) that a large proportion of Nigerian farmers are small-scale farmers who cultivate less than five hectares. Findings of this study also revealed that respondents that could not access a credit facility ranged between 62%-74.2% across the zones. This finding suggests that access to credit facilities in the area is limited. The decision to undertake agricultural and other non-farm activities is greatly influenced by financial resources, which access to credit can provide. An increase in access to credit by a given household will likely increase the level of non-farm diversification, which can, in turn, improve household wellbeing (Ibrahim & Onuk, 2009). The low level of credit access in the study area implies that a reasonable number of the respondents may lack the ability to undertake diverse livelihood activities that can improve their wellbeing due to the inadequacy of resources. Accordingly, social networks can enhance the status and economic performance of actors because they create opportunities to access the resources embedded in the networks of others even without direct connections, which is important for attaining sustainable livelihoods (Pretty, 2002; Abbay et al., 2019; Barooah, Chinoy, Dubey, Sarkar, Bagai, & Rathinam, 2019). In this study, over 60% of the respondents across the agro-ecological zones were non-members of any social group. This result implies a very low participation rate of the respondents in social group activities, which may limit their ability to acquire reasonable social capital necessary to enhance their livelihoods. This also has some implications on the respondents' vulnerability to

various ramifications of shocks and stresses. Similarly, access to remittances can contribute to reducing poverty and improved livelihoods (Olowa, Awoyemi, Adebayo, & Ayodele, 2013). Access to remittances can offer a huge chance of improving livelihoods and also create development opportunities both at the household level and the community at large. The distribution of the respondents based on the amount of remittance received showed that the mean was ₦44,734 (about USD\$127.8). The result further revealed that the Sudan Savannah zone had a high flow of remittance compared to the other regions. This can be attributed to the fact that the region is the most vulnerable to the insurgency, and this has tremendously affected the livelihoods of people in the area. Hence, migrant relatives and acquaintances support residents of the area with money and other valuables.

Table 1: *Socio-Economic Characteristics of the Respondents*

Variable	Southern Guinea Savannah (%)	Northern Guinea Savannah (%)	Sudan Savannah (%)
Age (years)			Mean = 46.35
<30	2.0	4.3	2.5
30-39	19.3	25.7	25.0
40-49	36.0	29.5	42.5
50-59	30.7	22.9	24.2
60 and above	12.0	17.6	5.8
Sex			
Female	13.3	12.9	14.2
Male	86.7	87.1	85.8
Marital status			
Married	91.3	89.5	95.8
Single	3.3	3.3	0.0
Divorced	2.0	1.4	0.8
Widowed	3.3	5.7	3.3
Household size (# of people)			Mean = 7
1-5	5.3	23.3	25.0
6-10	81.3	65.7	63.3
11-15	13.3	11.0	10.8
>15	0.0	0.0	0.8
Level of education			
Non-formal	15.3	33.8	26.7
Primary	40.7	50.5	50.0
Secondary	26.0	14.3	18.3
Tertiary	18.0	1.4	5.0

Table 1 continued

			Mean = 2.48
Farm size (Ha)			
1-5	81.3	88.6	95.0
6-10	16.0	11.4	4.2
>10	2.7	0.0	0.8
Access to credit			
No access	62.0	75.7	74.2
Access	38.0	24.3	25.8
Membership of group			
Non-member	60.8	65.4	60.8
Member	39.2	34.6	39.2
Access to remittance (₦)¹			Mean = 44,734
≥None	22.0	26.7	0.0
<100000	39.3	59.0	21.7
100000-199999	13.3	7.1	40.8
200000-299999	11.3	4.3	20.8
300000-399999	10.7	1.4	11.7
>399999	3.3	1.4	5.0

Source: Field Survey, 2018

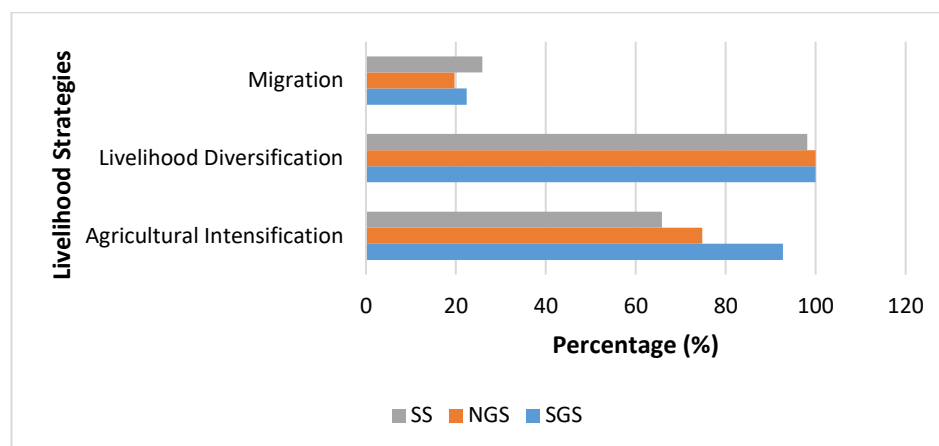
5.2 Livelihood Strategies in Rural Adamawa State

The distribution of the respondents' livelihood strategies is presented in Figure 2. Based on the result, migration was the least used (19.7%-25.9%) livelihood strategy across the zones of the State. This strategy was most common in the Sudan Savannah zone and can be attributed to the high level of insecurity (due to insurgency), which has constrained the livelihood of the people in the study area. This strategy could be temporal or permanent, depending on outcomes (Scoones, 1998). It may not be the entire family; it could be one or more family member(s) that leave the resident household for varying periods. Remittances are generated through migration in both economic and social forms, thereby enhancing asset accumulation. The most common livelihood strategy across the zones was livelihood diversification (over 98% across zones). This strategy involves an increase in the number of economic activities regardless of the sector or location at a given point in time (Oluwatayo, 2009; Aloba-Loison, 2017). In the study area, livelihood diversification is adopted as a consequence of economic push or constraints; hence, the need to widen income earning sources (Michael et al., 2016). The findings of the study further revealed that agricultural intensification was also a popular (65.8%-92.7% adoption across zones) livelihood strategy in the area. This implies that the strategy is the second most adopted strategy in the area. According to Carswell (1997), agricultural intensification implies increased average inputs of resources on land in order to maximise output from the farm enterprise. This strategy is most common in the

¹ The Naira (₦) is the Nigerian currency. At the time the study was carried out in 2018, USD \$1 was about ₦350.

Southern Guinea Savannah zone of the State and can be attributed to the favourable climatic conditions of the zone.

Figure 2. Livelihood Strategies in Rural Adamawa State.



*Multiple responses

Source: Field Survey, 2018.

5.3 Livelihood Activities of the Respondents

The distribution of respondents by their livelihood activities is presented in Table 2. The activities identified among the study population were broadly grouped into farm activities, skilled activities, semi-skilled/unskilled activities, and trading. As can be seen from the result, agriculture-related activities are the most dominant livelihood activities in the study area. Activities in this category include crop farming (78.6%-88.8%), rearing of livestock (66.8%-71.1%), and fishing (3.4%-10.6%). This high rate of participation in agricultural activities is common among rural areas both in Nigeria and in other parts of the globe (NBS, 2016). Agriculture, which is widely practiced and understood, has been identified to be a useful starting point for the development of livelihood. The sector traditionally contributes to improving food security and nutrition and remains key for stimulating growth, poverty reduction, and creating employment opportunities. The findings of this study also revealed that trading-related activities were the second most popular livelihood activities in the study area. Activities in this group include retail shop (kiosk) operation, sales of wild fruit, sale of thatch, sales of agricultural produce, among others. Semi-skilled/unskilled activities constitute the third-largest activity group among the respondents in the study area. These activities represent a very low cost, low return niche occupied by the respondents with very low human capital accumulation in either formal education or vocational training. Activities that fall under this category include woodcarving, hunting, ox-drawn plowing, spraying of herbicide, barbing/hairdressing, and beer brewing/sale, to mention a few. Skilled activities were the least activity group among the respondents in the study area. These activities refer to occupations for which requisite training is received by the respondents in the form of formal education or vocational training (from both informal and formal sectors). It encompasses the range of occupations found among the respondents, which include: civil service, carpentry, masonry, mechanic/electricians, etc. This can be attributed to the rural nature of the communities and lack of basic infrastructure.

Similarly, Table 3 presents the distribution of the respondents' level of diversification of livelihood sources. The average number of activities among the respondents was 2, indicating that they do diversify their livelihood sources

by taking up more than one income-generating activity. This has an implication on the level of vulnerability of the respondents to shock, especially when the activities are from unrelated sectors of the rural economy.

Table 2: *Distribution of Respondents According to Livelihood Activities*

Livelihood activity *	SGS (%)	NGS (%)	SS (%)
Farm activities			
Crop farming			
Livestock farming	88.8	87.3	78.6
Fishery/fishing	66.8	73.2	71.1
Skilled activities	10.6	8.7	3.4
Civil service			
Mechanic/electrician	9.7	10.9	8.6
Photography	1.0	2.3	0.8
Drug sales (chemist)	0.4	1.0	0.0
Blacksmithing	0.8	1.2	0.6
Carpentry	1.0	1.2	0.8
Masonry/bricklaying	1.4	1.6	1.2
Tailoring	1.3	1.5	1.4
Semi-skilled/ unskilled activities	1.8	2.3	1.5
Woodcarving			
Hunting	2.6	4.8	1.7
Ox-drawn plowing	3.8	2.4	1.5
Spraying of herbicide	3.4	3.1	2.3
Barbing/hairdressing	2.6	3.3	2.1
Beer brewing/sale	2.2	4.0	2.6
Butchery	2.5	1.5	1.8
Casual wage labour	0.6	0.9	0.5
Charging/Recharge card sales	8.9	6.8	9.1
Clergy/Malam	2.5	1.4	3.2
Grinding mill operation	1.0	1.0	1.0
Traditional herbal practice	0.8	0.1	0.0
Vulcanizing	1.3	1.6	0.3
Pottery	0.6	0.1	0.0
Car driving/motorcycle transport (Okada)	1.2	1.9	1.6
Oil pressing/sales of kulkuli	4.8	4.8	4.8
Firewood gathering/sales	1.4	1.6	1.2
Sand packing/local mining	2.7	2.5	0.9

Table 2 continued

Trading	0.8	0.7	0.1
Retail shop (kiosk) operation			
Sales of wild fruit	2.5	2.7	3.5
Sale of thatch	1.5	2.4	0.9
Sales of agricultural produce	1.0	1.0	1.0

*Multiple responses

Source: Field survey, 2018.

Table 3: *Distribution of the Respondents' Number of Livelihood Activities*

Number of activities	SGS (%)	NGS (%)	SS (%)
1-2	52.7	50.5	61.7
3-4	35.3	42.9	33.3
≥5	12.0	6.7	5.0
Mean 2			

Source: Field Survey, 2018.

5.4 Factors that Affect Livelihood Activities in Rural Adamawa State

To eliminate the multicollinearity problem before the estimation of the relationship between the variables used for the study, a pairwise correlation test was conducted for the explanatory variables. The result of the test revealed that there were no significant pairwise correlations among the variables. Similarly, all other assumptions of the OLS were tested to ensure that none was violated. The result of the ordinary least-square (OLS) regression used to examine factors affecting livelihood activities in the study area is presented in Table 4. Based on the result, the independent variables used were able to explain 40% of the variability in the dependent variable. Similarly, the model used had a good fit on the overall, considering its high F-value of 35.59 that was significant at 1% (p-value = 0.0000). The independent variables used were age (X_1), gender (X_2), marital status (X_3), household size (X_4), educational level (X_5), farm size (X_6), remittance (X_7), membership of a social group (X_8), and credit access (X_9). The findings of the study suggest that the household head's age (X_1) can negatively affect livelihood diversification in the study area (at a 1% level of significance). This implies that the prospect of adopting more activities may decrease with the advancement in age and vice versa. Similarly, the findings of this study also revealed that the number of livelihood activities might tend to increase for male-headed households compared to their female counterparts. This finding lends credence to the submission of Oluwatayo (2009), who asserted that access to resources in most rural communities across Nigeria has some gender considerations. Furthermore, this study established that marital status (X_3) plays a significant (at 1%) role in influencing livelihood diversification in the area. The finding revealed that married household heads may have a high likelihood of undertaking diverse livelihood activities compared to unmarried household heads. This may be attributed to the fact that married persons may tend to have relatively large household sizes, which can compel them to diversify livelihood sources to meet family demands. In the same vein, this study showed that

household size (X_4) may positively influence livelihood diversification significantly (at 1%). Based on the result, household heads with relatively larger membership sizes might have a higher likelihood of undertaking diverse livelihood activities compared to households with smaller members. This study also established that years of formal education (X_5) could significantly (at 1%) influence the adoption of diverse livelihood activities in the study area. The result implies that educated household heads may have a higher chance of diversifying livelihood sources compared to household heads with little or no formal education.

Table 4: *Factors Affecting Livelihood Activities*

Variable	Coefficient	Std. Error	Z-statistic
Age(X_1)	-0.012355	0.004123	-2.996948
Gender(X_2)	0.232374	0.127831	1.817830
Marital status (X_3)	0.422281	0.142027	2.973242
Household size (X_4)	0.110347	0.018840	5.856945
Educational level (X_5)	0.020106	0.010069	1.996785
Farm size (X_6)	0.060969	0.034929	1.745522
Remittance (X_7)	0.538081	0.104339	5.157050
Social group membership (X_8)	0.741066	0.116495	6.361353
Access to credit (X_9)	0.310343	0.096255	3.224175
Constant	0.780596	0.304021	2.567572
R-squared	0.405328		
Adjusted R-squared	0.393941		
S.E. of regression	0.948672		
F-statistic	35.59462		
Prob(F-statistic)	0.000000		
Durbin-Watson stat	1.850637		

*, **, *** Significant at 1, 5 and 10%, respectively
 Source: Eviews 9 software.

Furthermore, the finding of this study revealed that farm size (X_6) could be a significant (at 1%) determinant of livelihood diversification in the study area. Based on the result, increased farm size may likely reduce the likelihood of undertaking many livelihood activities at the same time. This is may be because having a large farm size can enhance the incoming earning capacity of the household heads; hence, they may not be pushed to see the need to undertake diverse livelihood activities. Similarly, the study indicated that access to remittance (X_7) may have a positive and statistically significant (at 1% level) influence on livelihood diversification. This means that as a household has more access to remittance, the chances of undertaking diverse livelihood activities increases, and vice versa. This could be attributed to the fact that remittances can increase households' access to financial capital, which can be deployed to other productive ventures to earn more resources. This study also revealed that social group membership (X_8) could increase the likelihood (at a 1% level of significance) of undertaking diverse livelihood activities in the study area. This implies that persons belonging to one or more social groups may have a higher possibility of adopting diverse livelihood activities than their counterparts that are

non-members of any association. This can be attributed to the access members of groups who can have a certain level of financial and social capital. The study as well established that access to credit (X_9) can have a positive and statistically significant effect on the likelihood of diversifying livelihood in the study area. This implies that respondents having access to credit facilities may have a higher chance of diversifying livelihood sources compared to those without access to credit.

5.5. *Livelihood Constraints in the Study Area*

The distribution of the respondents' livelihood constraints is presented in Table 5. Foremost among these constraints was the inadequacy of basic social amenities (over 90% across all zones) in the study area. As a consequence of these constraints, rural household heads might not have been able to have an improved livelihood outcome. According to Onwuemele (2015), the absence/inadequacy of basic social amenities or basic utilities (like portable drinking water, health facilities, good roads, schools, telecommunication, irrigation, etc.) hampers the productive capacity and potential of the people, plunging them into deeper abject poverty in Nigeria. The respondents reported the issue of poor political representation/governance (over 92%) as one of their main challenges in the area. Good governance is premised on improvements to 'virtually all aspects of the public sector and can impact both growth and income distribution in many ways (UNDP, 2002; Grindle, 2004). Insecurity was reported (61.3%-77.4%) as another leading impediment to having a beneficial livelihood outcome in the study area. This is because insecurity increases the vulnerability of households and can contribute greatly to decimating assets and other basic infrastructure in the area (Denney, 2013). This challenge is much prominent in Sudan Savannah and the Southern Guinea Savannah regions. Rural economic growth and development can be enhanced when rural residents have access to credit facilities that they can productively use (Nwankwo, 2013). However, in this study, the majority (55.3%-61.7%) lack access to the credit facility. This can seriously affect the productive capacities of the people, thereby limiting livelihood improvement. The respondents were also affected by adverse climatic conditions since they are mostly engaged in agricultural activities, which are strongly influenced by climatic conditions (Ali & Erenstein, 2017). Furthermore, agricultural activities in the area are also affected by the lack of farming inputs. Least among the constraints mentioned by the respondents across the agro-ecological zones was the issue of social exclusion. It limits the victims' access to resources obtainable in a given community, thereby reducing their resilience and making them vulnerable livelihood challenges.

Table 5: *Livelihood Constraints in the Study Area*

Constraint *	SGS (%)	NGS (%)	SS (%)
Poor political representation	92.7	93.3	92.5
Adverse climatic conditions	56.7	42.9	60.8
Inadequacy of basic social amenities	100.0	91.0	98.3
Insecurity challenges	61.3	81.9	77.5
Lack of farm inputs	34.7	31.9	34.2
Inadequate capital/financial exclusion	55.3	66.2	61.7
Social exclusion	30.7	28.6	27.5

*Multiple Responses

Source: Field Survey, 2018.

6.0 Conclusion and Recommendation

Findings of this study have established that in a bid by rural residents of Adamawa State to improve livelihoods, agricultural intensification, livelihood diversification, and migration were the main strategies. However, migration tends to be popular in the Sudan Savannah zone of the State compared to other zones. Similarly, the rural residents across the study area undertake diverse livelihood activities, among which agriculture-related activities were the most prominent. This has some policy implications with respect to promoting sustainable livelihoods in the study area. The study further revealed that livelihood diversification can significantly be influenced by people's socio-economic characteristics. These variables were age, gender, marital status, household size, educational level, farm size, remittance, membership of a social group, and access to credit. Rural residents' ability to have an improved livelihood outcome in the study area is being impaired by some challenges, especially inadequacy of basic social amenities, poor political representation, insecurity, and adverse climatic conditions. Therefore, enabling rural residents to overcome these livelihood challenges can substantially contribute to achieving sustainable livelihood through enhancing the people's resilience to shock and stress in the area. To promote livelihood improvement sustainably in the study area, the following recommendations should be adopted:

- There is a need for the government and other development partners to genuinely prioritise the provision of basic infrastructure across the rural parts of the State. This should be done based on the peculiar needs of communities, rather than a top-bottom approach that has been in practice over the years. This will encourage investments in both agricultural and non-agricultural activities in the area.
- There should be a concrete effort by the government to resolve the ever-recurrent farmers-herders conflict in the State. Similarly, in communities where normalcy has returned after the insurgency, there is a need for livelihood support aimed at rebuilding their livelihoods.
- Achieving sustainable livelihood is greatly influenced by the quality of political leadership in government. Hence, there is a need for sensitisation and awareness creation on the need for rural residents to become politically conscious and elect credible leaders.
- Farmers should be encouraged to form groups or cooperative societies to enable them to acquire different forms of capital that can better their livelihoods.
- Since farming is a leading livelihood activity in the area, agricultural extension packages should contain climate-smart agriculture techniques to enable farmers to adapt to climate change constraints.

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