Socio-Economic Characteristics and Livelihood Outcomes: Empirical Evidence of Farmers Organisation in Tubah Sub Division, Cameroon.

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Abstract

The lack of farmer contributions to agricultural production in Cameroon, as in most developing countries, has prompted farmers to seek different options to ensure household food security and maximize farm income. Therefore, in trying to find models for survival and the pursuit of growth, farmers draw their resources from all available places, through both formal and informal farming systems by doing so; they can no longer keep pace with agricultural production thus affecting their livelihood. This study specifically identified the socio-economic characteristics of farmer organizations and its effect on their livelihood. The data was elicited via survey questionnaire administered on the sample of 114 registered and 88 unregistered farmer organizations, which comprised of common initiative groups and cooperatives giving a total sample of 202. Using cluster-sampling approach, proximity villages were grouped into four clusters of villages and purposive sampling was used to selected members of the organisations to participate in the study. The objective of the study was achieved using ordinary least square regression estimation techniques. The result revealed that socio-economic characteristic of farmers has a negative significant effect on the livelihood of farmers' organization due to inadequate capital, low level of education, inadequate farming experience, inadequate income, inadequate farm size and the type of technology used for farming. Based on the finding this study recommends that the government should organize training programs, seminars, subsidize farm inputs, grant agricultural loans to farmers, initiate, and support mechanized agriculture to boast the agricultural sector hence improve the livelihood of farmers organisations.

Keywords: Livelihood Outcomes, Farmers' Organizations, Ordinary Least Regression

1. Introduction

Agriculture is the main employment sector for the poor, employing 76.3% of the extreme and 60.7% of the moderate poor (Woodhill et al., 2020). Most of this group tends to be subsistence or semi-subsistence oriented and faces significant barriers to entering higher value agricultural activities. The agrarian population in Cameroon is made up of essentially small-scale peasant farmers and their family members who make up about 70% of the agricultural population. In the face of an increasing population and settlement, the use of farm inputs that are not environmentally sustainable, and wide-scale agricultural and forestland use changes, food crop production trends seem to be uncertain or rather stagnant as studies reports that projected/expected needed crop production is often actual production. (Epule et al., 2012) argued that, between 1975 and 2005, there were 20years during which actual cereal production in Cameroon were persistently below projected/expected needed cereal production level. Epule*et al*. (2012) verified the vulnerability of experiencing food shortages along gender and poverty lines. Many past studies argued that, as in most sub-Saharan African countries, Cameroon is currently experiencing declines or stagnation in food production at the national scale, which could be attributed to their socio-economics characteristics(Epule et al., 2012). Agricultural adaptation requires a consideration of both human and physiographic challenges that are responsible in specific contexts(Yengoh & Arda, 2014) verified the role of land management practices and the socio-cultural properties of small-scale farmers in establishing differences in crop yields. Access to food is a basic need for human beings; however, many poor people do not have physical and economic access to sufficient, safe and nutritious food, McMichael. (2009). There are many factors that accounted for this condition of food security such as loss of job, lower level of education and employment, lack of access to land, single-parent families, unstable income level, and having a poor family head. All these factors lead to the condition of poverty and the fundamental outcome is inadequate access to food (Floro & Swain, 2013).

In Cameroon, agriculture remains the backbone of the economy, employing up to 70% of the labor force and generating about 42% of gross domestic product (GDP) and 30% of export earnings (World, 2012). Agriculture also provided 22.7% of value added in 2014, and an estimated 36.6% of the population is employed in agriculture (Bank, 2015). Cameroon has great agricultural potential due to its geographic location, which provides an ideal climate for growing cash crops and food crops (Anaciet, 2019). Despite this potential, the country continues to spend heavily on food imports. In 2011, the Treasury Department estimated that the government spent nearly FCFA 500 billion (about US$1 billion) on importing foodstuffs such as flour, rice, millet, sorghum and fish. Therefore, the government needs to address the problems of the agricultural growth sector as it contributes enormously to poverty reduction (Thirtle et al., 2003).The lack of farmer contributions to agricultural production in Cameroon, as in most developing countries, has prompted farmers to seek different options to ensure household food security and

maximize farm income. Therefore, in trying to find models for survival and the pursuit of growth, farmers draw their resources from all available places, through both formal and informal systems (Tolno et al., 2015). One way for farmers to increase agricultural production and improve their welfare is to pool and pool their resources to work together as members of Farmer Organizations (FO). FO is defined as "a collective unit of farmers from a village or several neighboring villages, united towards common goals related to economic or social benefits related to agricultural activity"(Willy & Holm-Müller, 2013). In other words, it is a group of rural farmers and producers who come together as FOs to provide services to members and improve rural incomes or employment opportunities in relation to agricultural activities. Strong and dynamic FOs can provide opportunities to farmers to play their role effectively in a market economy and benefit from it (Millie, 2006). The lack of inputs to agricultural production by farmers in Cameroon, as well as in most developing countries, has led farmers to look for different options to ensure household food security and maximize farm income especially during the Covid-19 pandemic era. Therefore, in attempting to find models for survival and the pursuit of growth, farmers draw resources from all available places, through both formal and informal systems to sustain their livelihood (Tolno et al., 2015). One way for farmers to increase agricultural production and improve their welfare is pool their resources to work together as members of Farmer Organizations.

The North-West region like other parts of Cameroon has since the 1960 witnessed the creation of thousands of FOs that have to play both social and economic roles for the benefit of the farmers as earlier mentioned. Recently countries that depend mostly on fossil fuels for its GDP have been finding it difficult to support its economy because of fluctuating fuel prices. Countries of Central Africa have been hard hit by these fluctuating prices especially during the Covid-19 era. One way of maintaining resilience in their economies is to lay more and more emphasis on agricultural development and productivity. In this light, it is important to understand how the livelihood of these FOs have been affected by this Covid-19 pandemic and if they play the important role expected of them because there is scanty knowledge on their functioning, effectiveness and sustainability of these created groups. In Cameroon, the government has formulated policies aimed at facilitating and empowering the growth and development of farmers organisation due to their contribution to the Cameroon economy like alleviating poverty, enhance human development, employment generation, and improve social welfare of the people. It is for these arguments that this study seeks to analyze the socioeconomic characteristics their effect on farmers' organization livelihood in Tubah Sub Division, the North West region of Cameroon. This paper is divided into five sections which are; introduction, literature review, methodology, results, and conclusions

Purpose of the Study

The Main Objective of the Study is to:

❖   Identify the socio-economic characteristics of farmer organisations and its effect on their livelihood.

The Main Research Question is:

❖   What are the socio-economic characteristics of farmer organisations and the effect on their livelihood?

2.   Literature Review

2.1 *Conceptual review of livelihood*

The primary focus of the sustainable rural livelihood approach is on household, specifically the ways in which the household uses assets to undertake a range of livelihood activities and to ensure livelihood security, defined "adequate and sustainable access to income and other resources to enable households to meet their basic needs," (Ogunmola, 2014). Households basic needs cover a spectrum of food, education, health and personal needs. It is important to note that in this framework, food security is one of many households needs and its thus but one of a range of factors household consider in determining how they balance competing interests to subsist in both short and long terms.

The term livelihood is often used interchangeably with economic strengthening and refers generally to economic production, employment, and household income. The term 'sustainable livelihoods' refers to a wide range of issues that cover much of the broader debate on the link between poverty and the environment. However, the existing literature often lacks clarity about how contradictions are resolved and compromises evaluated. As reported by (Carswell, 2002)" Definitions of sustainable livelihoods are often vague, inconsistent, and relatively narrow." Without explanation, we run the risk of simply conceptually confusing..." Based on Chambers and Conway (1992) and others, the IDS team's definition is Livelihood includes opportunities, assets (including material and social resources), and activities necessary to maintain. Livelihoods are sustainable when they are able to withstand and recover from stresses and shocks and maintain or increase their capacity and resources without jeopardizing natural resources. This in turn can be disaggregated to highlight different sub-components. There are five key elements of the definition, each relevant to the wider literature, in some cases with established methods of assessing the results. The first three focus on livelihoods, linking concerns about employment and poverty reduction to broader issues of adequacy, security, well-being and opportunity. The last two elements add a dimension of sustainability by looking at the resilience of livelihoods and the natural resources on which they partially depend. The concept of sustainable livelihoods is a combination of many ideas and interests, a combination of many different issues in the development debate. Different people will inevitably have different views on priority indicators, and when conflicts arise, decisions must be made. However, by breaking down definitions across a range of indicators,

these choices become clearer and allow for the negotiation of possible outcomes within any policy development, planning or implementation process that places sustainable livelihoods at its core.

2.2 Review Empirical literature on the link between socio economic characteristics and Livelihood

Anigbogu et al., (2015) examined in detail the impact of socio-economic characteristics of cooperative farmers on agricultural output, which is evident from farmers' production levels, using a usual least-squares regression model. The results showed that eight (age, education, farming experience, farm size, income, purchase of seedlings, purchase of fertilizer, and soil fertility) of the fourteen coefficients of the variables included in the model are significant. Twelve coefficients are positively related to production by cooperative farmers. The four coefficients, on the other hand, are inversely related to the production of the cooperative farmers. The cumulative effect of the explanatory variables in the model explains 95.9% of the variability in the factors affecting cooperative farmer production (Anigbogu et al., 2015)

Quisumbing*et al.*, (2021) carried a study on women's empowerment and gender equality in agricultural value chains in four countries in Africa and Asia. Baseline data were collected in Africa (Malawi, Benin) and Asia (Philippines, Bangladesh) to explore the relationships between gender equality, women's empowerment and participation in the diverse local agricultural value chains that make up the food system investigate. We find that the value chain and the specific engagement node are as important as other characteristics of individuals and households, but in different ways depending on the national context. Entrepreneurship – often practiced in wealthier, risk-taking families – does not necessarily empower women; and household wealth reflected in their property. Greater market participation does not necessarily mean greater gender equality. Education is positively correlated with greater self-determination for men and women, but the strength of this association differs. Training and counseling services are generally positively associated with empowerment, but they can also exacerbate inequalities in empowerment between men and women in the same household. In general, culture and context determine whether participating in value chains and which node in the value chain – constitutes empowerment. When designing interventions in food systems, the social and cultural context in which those food systems operate should be taken into account, so that interventions do not exacerbate existing gender inequalities(Quisumbing et al., 2021).

The socioeconomic conditions in nine communities of the Kenyan coast were examined to test the hypotheses that socioeconomic characteristics and knowledge about the sea differ for: (1) fishers compared to non-fishers; and (2) fishers living adjacent to parks compared to fishers living away from parks. Compared to non-fishers, fishers were poorer, had higher occupational diversity, more participation in community decision-making, and higher scores on six dimensions of knowledge about marine resources. Fishers living adjacent parks had lower occupational diversity, higher fortnightly expenditures, greater knowledge of the effects of land-based pollutants and market demands than non-park fishers. These relationships may however, be a result of urbanization near Kenya's marine parks, rather than the marine parks' effect on fishers' knowledge and livelihoods. Consistent with studies from other parts of the world, this study finds that there are aspects of Kenyan fishers' socioeconomic conditions and knowledge about the sea that characterize them as distinct from non-fishers. Initiatives designed to improve the socioeconomic conditions of fishers or to manage fishery stocks need to understand and account for these differences (Cinner et al., 2010)

Ogunmefun& Achike, (2015) analyzed the socioeconomic characteristics of rural farmers and problems associated with the use of informal insurance measures in Odogbolu Local Government Area of Ogun state, Nigeria. To give effect to the study, eighty farmers were randomly selected from the study area. A two-stage sampling procedure was used in the collection of priary data in Odogbolu LGA. The first stage involved a random selection of five (5) communities from amongst the communities in Odogbolu LGA of Ogun state. The second stage involved the selection of respondents/farmers from each of the communities using the sae insurance practices from the already listed informal insurance practices with probability proportionate to the size of each farming communities selected. Results showed all the measures used had factors that limited their effectiveness. Majority of the farmers (61%) identified their major problems with the use of informal insurance measures as entry constraints which was grouped into lack of credit, lack of credit facilities, Lack of working capital (assets like land) and lack of skills (education) (Ogunmefun & Achike, 2015).

3. Material and Methods

Sample Size and Data

The data used in this study were obtained from the survey questionnaire administered on the sample of 114 registered and 88 unregistered farmers' organisations, which comprises of common initiative groups and cooperatives. Using cluster sampling approach, proximity villages were grouped into four clusters villages as indicated on Table 1 and purposive sampling was then used to selected members of the organizations to participated in the study.

Table 1: Distribution of Farmers Organizations in Tubah Sub-Division

FOs	Registered FOs		Unregistered FOs		Total
Villages	CIGs	Cooperatives	CIGs	Cooperatives	
Bambui	42	5	13	18	78

Bambili	**23**	**2**	**13**	**4**	**42**
KedjomKetinguh	20	2	12	8	42
KedjomKeku	19	1	14	6	40
Total	104	10	52	36	**202**

Model Specification

In order to empirical achieve the objective, this study adopt the approach of the model of (Nanyongo & Bime, 2022) , as the argued that age of farmers, gender, and access to land, modern agricultural equipment, and agricultural training are among the significant drivers of farmers livelihood in Mezam division north West Region of Cameroon. The concept livelihood of farmers organisation is a multifaceted, meaning it can only be adequately measure using so many question items on the questionnaire (**see table 1:** indicators of livelihood of farmers organisation).

Table 2 Indicators of Livelihood of Farmers

	Indicator
Income level	L001_1
Level of wellbeing	L002_1
Improved food security	L003_1
Reduced vulnerability	L004_1
Sustainable use of natural resource base	L005_1
Skills and employment	L006_1
Level of education	L007_1
Sustainability of resources use	L008_1
Manufacturing equipment	L009_1
Land improvements	L010_1
High produce	L011_1
Money from sales of crops	L012_1
Improved lifestyles	L013_1
Improved housing conditions	L014_1
Reduced poverty	L015_1
	L016_1

Source: Computed by Author (2023)

In order to construct the farmer's livelihood index, the principle component analyses (PCA) was employed since PCA is designed to model relationships between categorical variables in terms of loadings and shared explained variance. The index of livelihood outcome was generated using the formula below. It is assumed that i designated livelihood dimension and LFO is the values of the composite index generated. The mathematical exposition for the index is given by;

$$LFO_i = \frac{\sum_{k=1}^{K} \sum_{jk=1}^{JK} w_{jk}^k L_{JK}^K}{K} \qquad 3.1$$

Where; LFO_i represents livelihood index for all the dimensions or domains considered; K is the number of indicators which is 15; JK the value of categorical indicator k; L is the loading of the indicators. The index of livelihood of farmers 'organisation was normalised within the range of 0 to 1. The reason for normalising the scores is to get rid of negative value of the index of livelihood, which poses interpretation challenges. In other words, by so doing we get rid of the negative values of the index by adjusting the scores within the range of 0 to 1. The mathematical exposition for the normalised index procedure is outline below;

$$\widehat{LFO}_i = \frac{(LFO - r(min))}{(r(max) - r(min))} \qquad 3.2$$

Where is r(max) is the maximum value while r(min) is the minimum value of LFO raw scores.

The empirical model is specified as follow.

$$FLO = \vartheta_1 + \vartheta_1 Male + \vartheta_2 PEDU + \vartheta_3 SEDU + \vartheta_4 TEDU + \vartheta_5 Married + \vartheta_6 Z + \varepsilon_1 \qquad 3.3$$

Where FLO stands for livelihood of farmers' organisation and it is an index computed using PCA and normalised; socio economic characteristics of farmers represents the exogenous variables as summarise in Table 3. While ε_1 captured the idiosyncratic terms which are other variables which can as well effect farmers' livelihood, though are assumed to have mean value of 0 and standard deviation of value 1. The parameters V1, V2, V3, V4, and V3 are to be estimated in the farmers' livelihood function using the ordinary least square estimation technique.

Table 3: Description of Variables

Variable	Code	Description
Dependent Variable	---	---
Farmers' livelihood organisation	LFO index	Continuous
Independent Variables		
Socioeconomic Characteristics		
Gender	---	---
Gender(1=Male, 0 otherwise)	Male	Binary
Gender(1=Female, 0 otherwise)	Female	Binary
Age Groups		
Age group (1=Age less than 20 years, 0 otherwise)	age l20	Binary
Age group (1= Age 20 years to less than 30 years, 0 otherwise)	age 20 l30	Binary
Age group (1= Age 30 years to less than 40 years, 0 otherwise)	age 30 l40	Binary
Age group (1= Age 40 years to less than 50 years, 0 otherwise)	age 40 l50	Binary
Age group (1= Age 50 years to less than 60 years, 0 otherwise)	age 50 l60	Binary
Age group (1= Age 60 years and above, 0 otherwise)	age a60	Binary
Marital Status		
Marital status (1=married, 0 otherwise)	Married	Binary
Marital status (1=Unmarried, 0 otherwise)	Unmarried	Binary
Educational Qualification		
Education (1=no education, 0 otherwise)	noedu	Binary
Education(1=Primary education, 0 otherwise)	pedu	Binary
Education(1=Secondary education, 0 otherwise	sedu	Binary
Education (1=Tertiary education, 0 otherwise)	tedu	Binary
Longevity in Farming		
Farm experience(1= 1 to less than 3 years, 0 otherwise)	farm exp1 l3 years	Binary
Farm experience(1= 3 to less than 6 years, 0 otherwise)	farm exp3 l6 years	Binary
Farm experience(1= 6 to less than 9 years, 0 otherwise)	farm exp6 l9 years	Binary
Farm experience(1= 9 years and above, 0 otherwise)	farm exp a9 years	Binary
Types of Farmers Organisations		
Membership (1= belong if member of CIG, 0 otherwise)	CIG's	Binary
Membership (1= belong if member of farmers' cooperative, 0 otherwise)	Cooperative	Binary
Membership (1= belong if member of farmers association, 0 otherwise)	Association	Binary
Income Groups(In Thousands francs CFA)		
Income (1=if income group is between 100 to 200 francs	inc 100 200 frs	Binary
Income (1=if income group is 201 to 400 francs	inc 201 400 frs	Binary
Income(1=if income group is 401 to 600 francs	inc 401 600 frs	Binary
Income(1=income group is 601 1000 francs	inc 601 1000 frs	Binary

Source: Compiled by the Author, 2023

4. Results and Discussion

Table 4: Demographic Characteristics

	Frequency	%
Gender		
Male	22	11.1
Female	176	88.9
Total	198	100.0
Age group		

Age; < 20	18	9.1
20—30	66	33.3
30—40	88	44.4
40—50	15	7.6
50—60	11	5.6
Total	198	100.0
Marital Status		
Married	88	44.5
Single	110	55.5
Total	198	100.0
Educational Qualification		
Primary	22	11.1
Secondary	86	43.4
Tertiary	20	10.1
No Education	70	35.4
Total	198	100.0
Farming Experience		
1—3	55	27.7
3—6	30	15.2
6-—9	7	3.5
9 above	106	53.6
Total	198	100.0

As shown in table 4, with respect to gender, majority 89.9% of the respondents are female while 11.1% of the respondents are males. Females majority is an indication that mostly the farming sector is composed mainly of females. So, their engagement in farming will enable them increase their farm production compared to men. With regards to age, all the respondents cut across the age brackets. However, majority of the respondents about 33.3% and 44.4% of them fall within the age brackets of 30-40years and 40-50years and above. This is indicating that agricultural sector is mainly in the hands of the aged who are at the verge of retirement. 44.5% of the respondents were married while 55.5% single. Majority of the respondents had formal education. But majority 43.4% of them have secondary education. Over 53.6% of the respondents had above nine years of farming experience. Which invariably is expected to impact positively on agricultural production.

Table 5: Descriptive Statistics of socio-economic characteristics of farmer's organization in Tubah Sub- Division

Variable	Obs	Mean	Std. Dev.	Min	Max
Gender					
Male	198	.455	.499	0	1
Female	198	.545	.499	0	1
Age Groups					
age l20	198	.066	.248	0	1
age 20 - 30	198	.293	.456	0	1
age 30 - 40	198	.323	.469	0	1
age 40 - 50	198	.202	.403	0	1
age 50 - 60	198	.096	.295	0	1
age a60	198	.02	.141	0	1
Marital Status					
Married	198	.652	.478	0	1
Unmarried	198	.348	.478	0	1
Educational Qualification					
Noedu	198	.131	.339	0	1
Pedu	198	.338	.474	0	1
Sedu	198	.222	.417	0	1
Tedu	198	.308	.463	0	1
Longevity in Farming					
farm exp1 - 3 years	198	.222	.417	0	1

farm exp3 - 6 years	198	.247	.433	0	1
farm exp6 - 9 years					
farm exp a9 years					
Types of Farmers Organisations					
CIG's					
Cooperative					
Association					
Income Groups(In Thousands francs CFA)					
inc 100- 200 frs					
inc 201- 400 frs					
inc 401- 600 frs					
inc 601- 1000 frs					

Source: Computed by Author (2023)

Table 5shows a summary descriptive statistics for socio-economic characteristics of farmer's organizations, their observation, mean, standard deviation, maximum, and minimum values. The total distributed questionnaires were 202, among this number only 198 was returned while 4 questionnaires were unreturned as seen above. This statistics was captured in the form of binary (0 & 1) that is why the minimum values are zero (0) and the maximum values are one (1). Based on gender of the respondents above, averagely it shows that females have a mean of 54.5% and a Standard deviation of 49.9%. Meanwhile, male has a mean of 45.5% and a standard deviation of 49.9%. This finding indicates that both female & male farmers were well represented. Balance of opinions is necessary to reduce opinion disparity bias in the study. Its further shows that female farmers are more represented than male counterpart in farmer's organization in the North West region.

Also, for the various age groups which ranges from less than 20 years, 20 to <30, 30 to <40, 50 to <60 and 60 years above. From these age groups, 30 to < 40 has the highest mean of 32.3% and a standard deviation of 46.9%, second highest mean are those with ages 20 to < 30 that is 29.3% with a standard deviation of 45.6%. These age groups are the strongest age groups who can work for long hours in farms, they also have much time to do multi task, and are mostly graduates who con concentrates in farming without distractions from schools. Meanwhile, the lowest mean of age group are those with less than 20 years and those from 60 years above with means of 6.6% & 2% respectively and standard deviations of 29.5% & 14.1% respectively this is because those who are less than 20 years are into school like secondary and tertiary education while those above sixty years are already aging so they cannot work for long hours this called for the reasons why we have small percent of them in farming.

More so, in Table 5 based on marital status, it shows that out of the total number of population, the married persons has a mean of 65.2% while the mean for unmarried is 34.8. This finding indicates some level of social cohesion. More so, it is relevant to know that marital status is a responsibility and stability at individual and community level. Married individuals may be more likely to have grown up in a family with a farming background and continue the tradition. They both have the same standard deviation which 47.8%

Moreover, for educational qualification, it was captured form no level of education, primary, secondary and tertiary education. Quantitavely, primary education has contributed the highest mean which is 33.8% and a standard deviation of 47.4%, this was followed by tertiary education with a mean of 30.8% and a standard deviation of 46.3%, This statistics explains that among the farmer's organizations in NWR most of the farmers are educated persons with primary and tertiary education; this was also the reason why we have mostly youths 30 to 40 years toping in farming organizations, many have learned advance technical skills which can improve agriculture and while those with no education has the lowest mean which is 13.1% and standard deviation of 33.9% this might be because of the inadequate technical skills needed in farming.

In addition, from table 5, is shows that farmer's with farming experience of more than 9 years turns to have the highest mean which is 40.4% and a higher standard deviation of 49.2%, while for those with 6-9 years' experience and 13 years' experience have the smallest mean which is 12.6% and 22.2% respectively, the remaining statistics can be seen in the above table. Further, with regards to types of farmers organizations, the CIG's has the highest mean which constituted 63.1% and a standard deviation of 48.4%, averagely cooperative has 25.8% as mean and 43.8% as standard deviation while associative has the smallest mean of 11.1% and standard deviation of 31.5%.

Furthermore, the income group's for this research ranges from 100,000 to 1,000,000 frs. The above table shows that people with income levels that ranges from 100,000 to 200, 000 has the highest mean and standard deviation of 50% while those with income levels from 601,000 to 1,000,000 has the lowest mean of about 5.1%.

Table 6. Descriptive Statistics for farm characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max
Farm Size					
fs L1hectare	198	.495	.501	0	1
fs1 L3hectare	198	.389	.489	0	1
fs3 L7hectare	198	.096	.295	0	1
fs A8hectare	198	.02	.141	0	1
Types of Technology					
capital intensive	198	.146	.354	0	1
labour intensive	198	.571	.496	0	1
mix intensive	198	.283	.452	0	1
Major Crop Cultivated					
cash crop	198	.217	.413	0	1
food crop	198	.783	.413	0	1
Fertility of the Land					
fertile land	198	.449	.499	0	1
not fertile land	198	.551	.499	0	1
Quantity of fertilizer					
fertilizer 0 50kg	198	.333	.473	0	1
fertilizer 100kg	198	.323	.469	0	1
fertilizer 150kg	198	.101	.302	0	1
fertilizer 200kg	198	.091	.288	0	1
fertilizer A200kg	198	.152	.359	0	1
Quantity of Seedling					
seedling 0 50kg	198	.409	.493	0	1
seedling 100kg	198	.273	.446	0	1
seedling 150kg	198	.116	.321	0	1
seedling 200kg	198	.086	.281	0	1
seedling A200kg	198	.116	.321	0	1

Source: Computed by Author (2023)

According to Table 6 based on farm size, it shows that farmer's with less than 1 hectare of farm size turn to have the highest mean and standard deviation of 49.5% and 50.1% while for those with 8 hectares of farm size and above they has the lowest mean and standard deviation of 2% and 14.1%. So, Farmers with low income may have limited access to modern farming technologies, equipment, and inputs like fertilizers and pesticides. This restricts their ability to optimize crop yields and quality, leading to a wider variation in their production outcomes. Farmers with low income often have limited access to education and training programs that can help them improve their farming practices and management skills. As a result, they may struggle to adopt efficient and effective practices, leading to higher variability in their income and productivity. Despite the varieties of technology used in farming, those with labour intensive has the highest mean (57.1%) and standard deviation (49.6%) than others, in which mix intensive has a mean of 28.3% and a standard of 45.2% meanwhile capital intensive has the lowest mean and standard deviation which are 14.6 and 35.4%.

With regards to major crop cultivated, we had two types' cash crop and food crops, so according to table 6 above, food crop has the highest mean (78.3%) and 41.3% is the standard deviation meanwhile cash crop has a mean of 21.7% and the same standard. Also, for fertility of land, fertile land has the lowest mean as compared to the non-fertile land with its own mean been 55.1%. Moreover, farmers who obtained quantity of fertilizers from 0-50kgs have the highest mean 33.3% and the standard deviation was 47.3% as seen above. This was followed by 100kgs of fertilizer with mean (32.3%) and standard deviation (46.9%). The lowest mean and standard deviation (9.1%) & 28.8% than those with highest kgs of fertilizers such as 200kgs.

Table 7: Result of Socio Economic Characteristics on livelihood outcome

	(1)
VARIABLES	Lo
Female	-0.103***
	(0.0326)
age_l20	-0.114
	(0.154)
age_20_l30	-0.0182

	(0.133)
age_30_l40	0.00651
	(0.127)
age_40_l50	-0.00974
	(0.126)
age_50_l60	0.00813
	(0.138)
Married	-0.0256
	(0.0387)
Pedu	-0.0359
	(0.0595)
Sedu	-0.00465
	(0.0616)
Tedu	-0.104*
	(0.0608)
farm_exp3_l6_years	-0.126**
	(0.0557)
farm_exp6_l9_years	-0.00887
	(0.0637)
farm_exp_a9_years	-0.0200
	(0.0581)
inc_201_400_frs	0.172***
	(0.0371)
inc_401_600_frs	0.100
	(0.0697)
inc_601_1000_frs	0.181***
	(0.0665)
Association	-0.214***
	(0.0612)
Cooperative	-0.139***
	(0.0485)
Constant	0.702***
	(0.148)
Observations	195
VIF	3.67
Ramsey Reset Prob.	0.5604
IM test	149(0.0032)
R-squared	0.387

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

According to the results in Table 7 based on the gender of the respondents, its shows female as compared to male have a negative relationship with livelihood outcomes. This implies that on average many female will lead to a decrease in livelihood outcomes than males in farmer's organization. This might be that female carryout most domestic works than male and they later come to work after the males. This result is significant since the probability value (p-value) is less than 1% level of significant.

Table 7 shows the contribution of age groups, those with age less than 20 years and 20 to less than 30 years averagely lead to a decrease in livelihood outcomes than those with above 60 years old, and this is because these age groups are still going to school and they still have little experience in farming and also many are not eligible to joined farmers organization. More so, the age group "30 to less than 40 years" averagely led to increase in livelihood outcomes than those with above 60 years old. This is because this age group has completed most studies and they are more focus to goal oriented and energetic and are fully into work with skills, thus they contribute and enhance farmer's organization. For the age group 40-50 years, they decreases livelihood outcome this is because they are becoming weak and work less hours than before this lead to the decrease in livelihood outcomes in farmer's organizations.

In addition, a married individual on average decreases livelihood outcome by 0.026 more than the unmarried individual. Since the p-value is not less than 5%, this difference is not statistically significant. This explained that most married individuals turn to

engage with different domestic work. More so, it is relevant to know that marital status is a responsibility and stability at individual and community level.

More so, with regards to educational qualification, the individuals with primary, secondary and tertiary education have a negative relationship with livelihood outcomes in farmer's organization. These categories of education averagely lead to decrease in livelihood outcome more than those with non-education. This implies that those with non-education have a high contribution to livelihood outcome in farmer's organization meanwhile, those with certain level of education contribute less to livelihood outcome in farmer's organization this might be that those with education pay less time with farmers education and are into different activities as well. Among these levels of education, only tertiary education was significant at 10% level of significant. Though negative, it reduces livelihood outcome by 0.104 more than those with no education.

Also, those with different farming experience have a negative association with livelihood outcome in farming organization. This explains that the level of experience these farmers have achieved is not enough to increase or improved the livelihood outcomes of farmer's organization. Among these groups of farming, experience only those with farming experience from 3 to less than 6 years have a significant influence on livelihood outcome more than those with less than 1 to 3 years of farm experience. This result is significant since the probability value (p-value) is less than 5% level of significant. Meanwhile the other years of farm experience are negative and insignificant which will averagely decreases livelihood outcome more than those with less than 1 to 3 years of farm experience.

Additionally, the different income levels show a positive relationship with livelihood outcome in farmer's organization. This implies that on average an increase in any of the income levels will increase livelihood outcome in farmer's organization more than those with income from 100000 to less than 300000 FCFA. This shows that the different income levels have a linear relationship with livelihood outcome in farmer's organization, also the livelihood outcome in farmers organization need much income to progress their agricultural activity. Farmers with income level that ranges from 301000 to less than 600000 FCFA and 601000-1000000 FCFA is statistically significant since their probability values (p-value) are less than 1% level of significant.

Furthermore, based on farms organization, on averagely the associative and cooperative farm organizations have a negative association with likelihood outcomes than CIG farm organization. Although it is significant, the decrease in likelihood outcomes may be that these organizations have inadequate technical skills and small capital intensive.

The R-square value which is the measure of the goodness of fit is 0.387 which implies that 38.7% changes in livelihood outcome can be portray by changes in the explanatory variables as shown in the table above which indicate a low positive effect between the variables. In addition, the mean variance inflation factor (VIF) is 3.67, which indicate that the models specified do not suffer from the problem of multicolinearity. Also, Ramsey reset test was perform on the regression to check if there is any missing variable, but the results prove to have shown that there is no omission of variables.

5. Conclusion

In conclusion, the study aim was to identify the socio-economic characteristics of farmer organisations and its effect on their livelihood. Taking a cursory look at the all the variables entered in the model has a significant negative effect. Using the ordinary least square estimation technique, the result revealed that socioeconomic characteristic of farmers has a significant effect on the livelihood of farmers' organization. Though some variables exert negative significant effect.Gender of the respondents has a negative relationship, which indicate that an increase in females involve in agricultural activities will bring about a decrease in their livelihood than males. This is because females involve in agricultural activities seek additional ways and means of earning income to maintain themselves by so doing are engaged themselves in unsustainable farming practices that influences their livelihood.Age has positive and negative significant relationship with the farmers'livelihood outcomes. Agricultural activities of those of the older age group will lead to a decrease in livelihood. Suggesting that a year increase in the ages of the farmers will bring about a decrease in their livelihood since some of them are becoming weak and will now be rendering less hour for work. Farming experience have a negative association with livelihood outcome in farming organization. This explains that the level of experience these farmers have achieved is not enough to increase or improved the livelihood outcomes of farmer's organization. The different income levels show a positive relationship with livelihood outcome in farmer's organization. This implies that on average an increase in any of the income levels will increase livelihood outcome in farmer's organization.Furthermore, based on farms organization, on averagely the associative and cooperative farm organizations have a negative association with likelihood outcomes than CIG farm organization. Although it is significant, the decrease in likelihood outcomes may be that these organizations have inadequate technical skills and small capital intensive. All the negative relationship is due to inadequate capital, low level of education, low farming experience, inadequate income, inadequate farm size and the type of technology used for farming.Based on the finding this study recommends that the government should organize training programs, seminars, subsidize farm inputs such as fertilizers, grant loans to farmers and create more agricultural research centers to boast the agricultural sector hence improve the livelihood of farmers organisations.

Recommendations

Based on the analysis and findings of this study, the researcher therefore recommends that:

❖ Farmers should be encouraged to create more CIGs and for those who have not yet join should be able to do so. Through these CIGs, the government can then assist the farmers with financial support and loans at low interest rates that will help them invest in agriculture and other small businesses and as such their living standard will be improved and a greater output will be attained.

❖ More agricultural infrastructure and training centers be created to help improve farmers experienced because it has been identified as one of the major challenges faced by the cooperative farmers in improving agricultural production

❖ Agricultural financial institutions should be created. Providing adequate credit to the farmers is therefore imperative. This will help improve the farmers output. Increased output leads to increased income and increased capital investments in the agricultural sector.

❖ The state should grant agricultural loans to farmers, initiate, and support mechanized agriculture. This will help improve the productivity and efficiency of farmers in Tubah-sub division

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