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Role of Farmer Organizations in the Reinforcement of the Economic Capacities of Farmers in Mezam Division, Cameroon

**Kenette Fru Mbangari^{1*}, Mathias Fru Fonteh²
and Guillaume Hensel Fongang Fouepe¹**

¹*Department of Agricultural Extension and Rural Sociology, University of Dschang, P.O. Box 222, Dschang, Cameroon.*

²*College of Technology (COLTECH), University of Bamenda, P.O. Box 39, Bamenda, Cameroon.*

Authors' contributions

This work was carried out in collaboration among all authors. Author KFM managed the literature searches, collected data, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors MFF and GHFF read the final version of the study and agreed upon. All authors read and approved the final manuscript.

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ABSTRACT

This study was carried out from February 2018 to June 2019 in Mezam Division-Cameroon, under the auspices of the Program for the Improvement of Competitiveness of Family Agro-pastoral Farms (PCP-ACEFA) and the North West Farmers' Organization (NOWEFOR). The objective of the study was to assess the role of FOs in the reinforcement of the economic capacities of farmers in the region. Secondary sources data were reviewed while primary source data were gotten directly from farmers in the field. Two hundred and eighty (280) farmers' members of these FOs were interviewed using a semi-structured questionnaire and 7 leaders were interviewed using an interview guide. In addition, direct observations were made. The data collected were analyzed using SPSS. The findings show that, 18.57% of the respondents who possessed agricultural equipments in their farms

*Corresponding author: E-mail: frbangari@yahoo.com;

from the support of SOS Faim/EC, 17.14% as a result of MINADER support, 20% as a result of ACEFA support and 44.28% coming from the farmers own capital. Beneficiaries of the aid hired 30% of workers compared to 12.8% the non beneficiaries. The contribution of FOs in the development of the economic capacities of farmers was overall positive as 48.57% of the beneficiary farmers had a higher income than non beneficiaries. The beneficiaries' respective mean annual gross margin for market gardening (263, 863), poultry (375,343) and piggery (64,615) are statistically higher than that of non beneficiaries. Conclusively FOs are pivotal for farmers in the development process and the strengthening of the economic capacities of farmers.

Keywords: Farmers; farmer organizations; economic; capacity; reinforcement; role; Cameroon.

1. INTRODUCTION

Agriculture is the backbone of the economy of Cameroon with 75% of the population involved in agriculture and the sector contributes 90% of exports [1]. The agricultural sector also represents 36.3 of the Gross Domestic Product. In addition, agriculture is the main source of raw materials to food processing, breweries, etc [2]. The welfare of individual farmers and/or households is determined by the level of the individual farmers and/or the household's access to and control over welfare assets such as truck, engine pump, wheel barrow, sprayer, etc. Being able to access, control and own basic productive resources enable people to lead improved and stable livelihood [3]. NOWEFOR [4] reported that farmer organizations (FOs) play a pivotal role in the economic reinforcement of the capacities farmers by improving access to productive resources thus leading to high farm incomes and general standards of living. Furthermore FOs share experiences on production and marketing techniques; and organize group purchase of inputs and sales of farm produce. Penunia [5] stated that FOs are essential institutions for empowerment, poverty alleviation and development of farmers and the rural poor. He signaled that FOs help farmers economically gain skills, access inputs, form enterprises, process and market their products more effectively to generate higher incomes. By organizing, farmers can access information needed to produce, add value, market their commodities and develop effective linkages with input agencies such as financial service providers, as well as output markets. FOs can achieve economies of scale, thereby lowering costs and facilitating the processing and marketing of agricultural commodities for individual farmers.

Farmer organizations in Mezam Division-Cameroon are involved in the provision of micro-

credits, quality inputs, and trainings in agriculture to members, to sustain their agricultural activities, increase their incomes and enhance them to lead in development initiatives in their communities [6]. However, farmers who these farmers' organizations targeted in order to better their living conditions through better access to productive resources and group marketing, appear not to have been empowered in a way that will guarantee the sustainability of the farmers' movements. Besides, studies have been carried out on the evaluation of farmers organizations [7,8] but it appears no impact assessment has been carried out at the individual level to show whether the contribution provided to farmers by farmers organizations have a positive impact on the farmers. It is in this light that this study was undertaken to know what economic contribution has been brought about by FOs on the target population at the individual level within the framework of poverty alleviation. The objective of the study was to assess the role of FOs in the strengthening of the economic capacities of farmers in Mezam Division-Cameroon.

2. THEORETICAL FRAMEWORK AND CONCEPTS

Asante-Addo, et al. [9] highlighted that FOs in Ghana contributes or play an important role in the granting of micro loans and its services to farmers, training them in their activities and boosting membership in their organization. Farmer organizations involve in micro-credit programs because of improved access to credit for farming purposes and savings mobilization. Such market smart strategies have the potential to improve farmers' access to timely credit and to reduce rural poverty. For Gouët, Leeuwis, & Van Paassen [10] FOs are characterized based on their history, reason of existence, objectives, and ambit of actions, degree of formalization, and their domain of intervention.

All impact assessments comprise three main elements: a model of the impact chain that the study is to examine; the specification of unit(s) or levels, at which impact is assessed and the specification of the type of impact that are to be assessed. Impact Assessment (IAs) measure the difference in the key variables between the outcomes on “agents” (individuals, enterprises, household, community, etc.), which have experienced an intervention against the values of those variables that would have occurred had there been no intervention aid program [11]. Masud and Yontcheva [12] measured the impact of aid on infant mortality and illiteracy using regression as Human Development indicators and the outcome illustrated that increased health expenditure per capita reduces infant mortality as does greater NGO aid per capita. In order to carryout an acceptable impact assessment, researchers need to

define first their overall strategy which sets the course for the rest of the research process [11,13].

Alternatively the study sought the indicators of the role of farmer organizations (FOs) in the reinforcement of the economic capacities of farmers in Mezam Division, Cameroon through an impact assessment of the observable and measurable changes between the outcomes on “agent” (individuals and organization) that have experienced aid interventions against the values of those variables that would have occurred had there been no aid intervention as shown in Fig. 1. The findings will help concerned policy makers (PCP-ACEFA, SOS Faim Luxembourg and European Union) to take appropriate decisions in formulating aid assistance strategies that will help improve the living conditions of farmers and FOs.

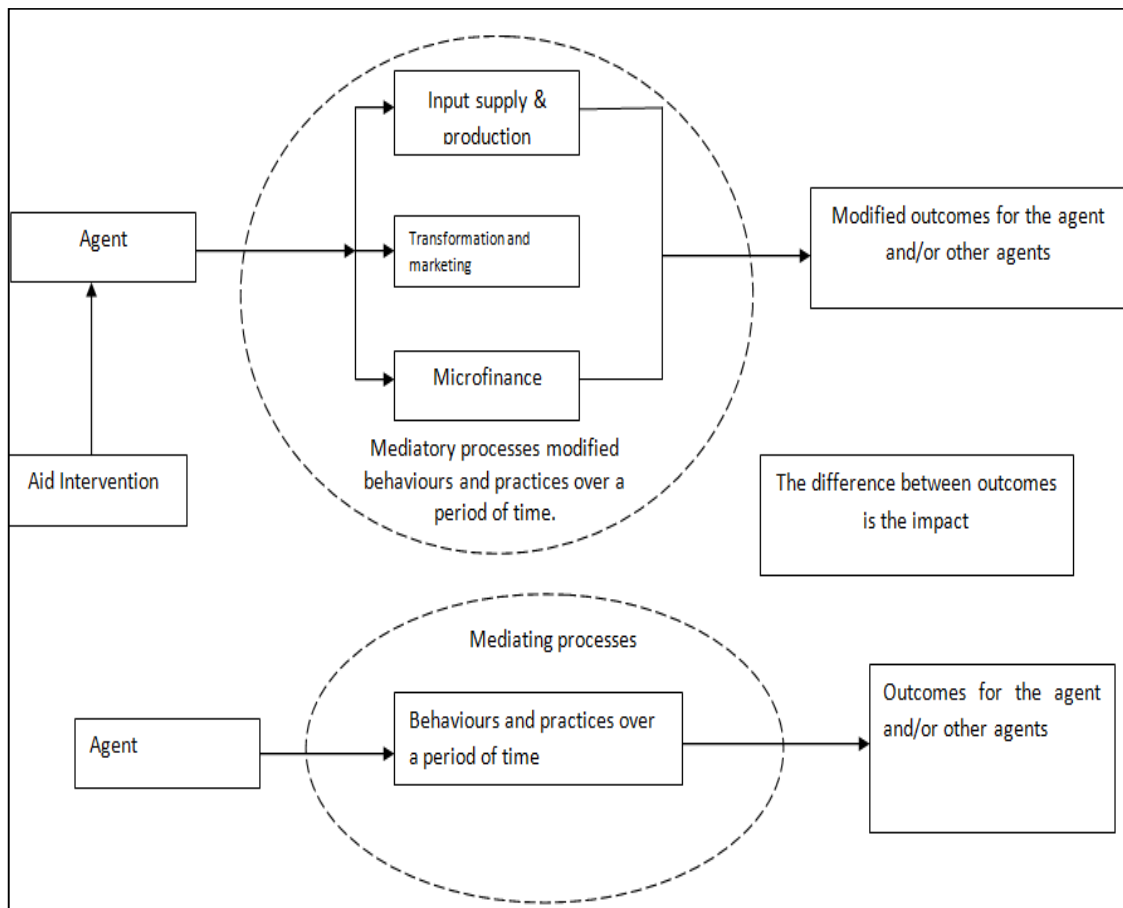


Fig. 1. The operational model of the impact chain for the study

Source: Adapted from Hulme [11]

3. MATERIALS AND METHODS

3.1 Study Area

The study was conducted in Mezam Division-Cameroon. Mezam Division is located between latitudes 5°40' and 7°50' North and longitudes 9°80' and 11°51' east of the Greenwich Meridian [14]. Mezam has a total surface area of 1,841.45 km² with a total population of 524, 127 inhabitants in the 2005 census. The agricultural population is estimated at 258,467 inhabitants representing 43.07% of farm families (Republic of Cameroon, 2015). This population belongs to a large set of Ethnic groups, made up of several tribes such as Ngemba (Awings, Mankons, Bafuts, Nkwens, Pignins, Akums, Njongs), Mugahkah (Bali), Bei (Baba IIs, Bafochus), etc. (Fig. 2). The climate is of the tropical savannah type with two distinct seasons: the rainy and the dry seasons. The rainy season starts from mid-March to mid-October. The dry season is characterized by winds and runs from late October to mid-March. Vegetation comprises dotted patches, artificial and natural forest, short and thick grasses, hence its name "Grass-field".

3.2 Data Collection

A descriptive and cross-sectional research design was used to generate data for this study. Data for the study were obtained from two sources: data from secondary and primary sources. Secondary source data were obtained from relevant literature existing in documents and archives of several structures such as: the central library of the University of Dschang, British Council library in Bamenda, DDARD annual reports, ACEFA activity reports, project reports, evaluation reports and from the internet,

etc. In order to analyze the place of FOs in the reinforcement of the capacities of farmers, secondary source data from DDARD annual reports, ACEFA activity reports, project reports, evaluation reports, baseline studies reports, mission reports and additional information from administrative authorities were used. The information was summarized such as to bring out a clear picture of the economic reinforcement role of FOs operating in the Division. Primary source data were obtained via observations, interviews (focus group discussions, meetings) and the administration of questionnaires to the beneficiary farmers covered by the FOs.

3.3 Sampling

A stratified random sampling method was used. The population of the study was divided into strata (Table 1). Firstly, out of the five Divisions, Mezam Division was chosen because it has the highest number of FOs constituting 41% of the 16,425 FOs in the North West Region. Secondly, 1% of the 6,725 FOs in Mezam Division of the NWR were obtained to constitute the sample size which gave us 70 FOs. Reason being that the 6,725 FOs was information from the Regional Delegation of Agriculture and Rural Development, but as we went to the field, it was noticed that the information gotten from PCP-ACEFA and NOWEFOR in Mezam Division, based on accessibility and security was only 403 FOs as shown in Table 1. Thirdly, for comparison purposes and following aid intervention, the sample size was also broken down into 40 beneficiary FOs and 30 non beneficiary FOs. Fourthly, Four (04) members belonging to each of the farmers' organisations in the seven Subdivisions' of the aid in Mezam Division were interviewed.

Table 1. Distribution of sampled farmers' organisations and farmers per subdivision

Subdivisions	No. of FOs per subdivision	Targeted FOs	Non beneficiary FOs	Total FOs interviewed	Total number of farmers interviewed
BAMENDA I	12	6	4	10	40
BAMENDA II	96	6	4	10	40
BAMENEDA III	12	6	4	10	40
BAFUT	84	6	4	10	40
BALI	60	6	4	10	40
TUBAH	43	6	4	10	40
SANTA	96	6	4	10	40
Total	403	40	30	70	280

Source: ACEFA Mezam Division, 2019

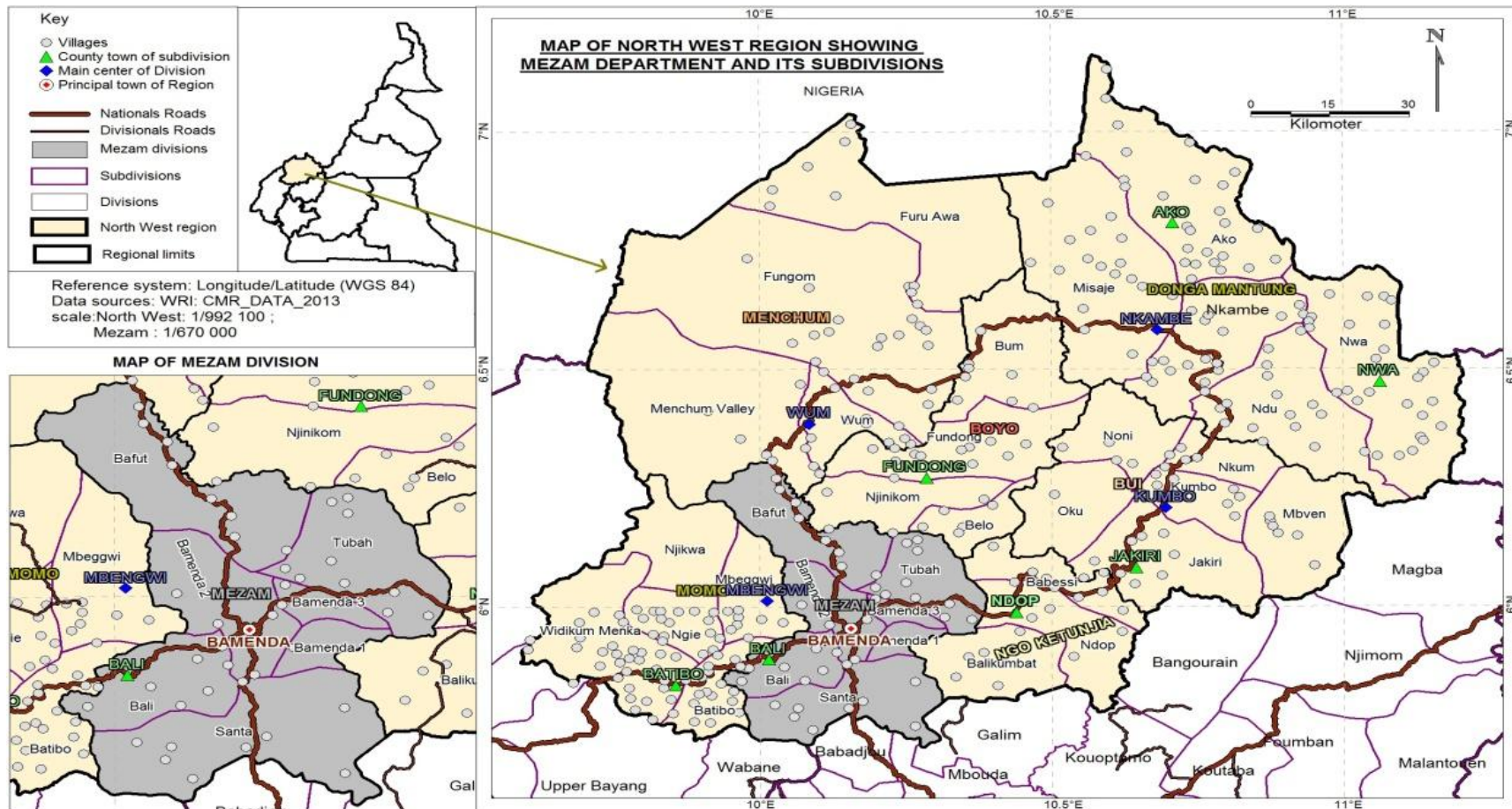


Fig. 2. Map of the North West Region showing Mezam division
 Source: [https:// en. Wikipedia.org/wiki/North West Region \(Cameroon\)](https://en.wikipedia.org/wiki/North_West_Region_(Cameroon))

These data obtained were analysed using Statistical Package for Social Sciences (SPSS). The parametric student (t) test and descriptive statistical tools were used to analyze the findings. These findings are presented in form of simple cross-tables, frequencies distributions percentages and parametric student test.

4. RESULTS AND DISCUSSION

4.1 Contribution of FOs in Enhancing Financial Capacities of Famers

This section presents the income evolutionary trends; level of agricultural mechanization, labour utilization and farm income of respondents as follows:

Income evolution pattern: The distribution of annual farm income evolution pattern for the last 12 months is presented in Table 2.

Table 3 indicates that, 48.57% of the respondents targeted by the external aid in Mezam division have a general increase in farm income. Also 21.42% of the female beneficiaries have a positive change in their income evolution pattern. These findings are consistent with Aryeetey [15], Nshom [16] and Maria, et al. [17] who highlighted that aid helps farmers to increase their farm incomes. The creation of new activities, timely application of fertilizers, good agricultural season, and support from external aid is some of the reasons for the positive change in income.

Moreover, 48.57% of the beneficiaries farm incomes increased as compared to 11.42% of the non beneficiaries whose incomes increased. These findings agree with those of Msuta and Urassa [18] who reported that beneficiary farmers of FOs had a relatively higher income and gross margins compared to non beneficiary farmers. Testimonies of a farmer from Mforyah help us to have a feel of the impact:

“A farmer in Mforyah_Bafut has increased his production from about 10 baskets of tomatoes per week to about 20 each week; he has a turnover of at least 150,000FCFA. He has changed the roofing of his house, all his children go to school and he now employs more than two youth his farms daily. He is active member of the Mforyah union.”

These findings also abide with the conclusions of Cheston, et al. [19] who stated that aid helped farmers to have a positive change in income. It

could be inferred from this that aid contributes positively to the evolution of incomes of the farmers and hence general standard of living.

Contribution to the level of agricultural mechanization: The level of agricultural mechanization in this study was inferred from the different types of equipments used by farmers in their farms are illustrated in Table 3. The results show that both the beneficiaries and non beneficiaries have agricultural equipments in their farms. However, the proportion of external aid beneficiaries possessing agricultural equipments in their farms outweighs those of the non beneficiaries. Also, Table 3 reveals that 18.57% of the respondents who possessed agricultural equipments in their farms result from the support of SOS Faim/EC, 17.14% as a result of MINADER support, 20% as a result of ACEFA support and 44.28% coming from the farmers own capital.

These findings affirm with the conclusions of Hulme [11] and [20] who both reported that aid in the form of micro credit contributes to the possession of agricultural equipments by farmers in their farm. These findings agree with those of Msuta and Urassa (2015:2344) who reported that farmers' organizations (FOs) provide services such as access agricultural inputs, access to knowledge, information, reducing transaction costs associated to marketing, allow collectively lobbying for desired changes, and as such they contribute to positively influence agricultural policy outcomes in Kasula district of Tanzania.

These findings tie with those of Shrestha [21] who reported that farmer organizations assist farmers in accessing farm technologies such as trainings, inputs and farm tools; information; credit and better market access for farm products.

This implies that the impact of the FOs on the possession of agricultural equipments by farmers is positive.

Contribution on the use of labour: The impact of aid would be positive on the activities of the farmers if they use more and more non-family, paid and skilled labour. Table 4 illustrates this.

Table 4 shows that majority of the respondents employed workers in their farms for the production of crops and livestock. Beneficiaries of the aid hired 30% of labourers against 12.8% the non beneficiaries. These findings abide with those of Aryeetey [15] and Nadia and Boriana

[22] who both reported that aid plays a significant role reducing household vulnerability to a number of risks such as creation of employment. These results also tie with those reported by Fongang and Fru Mbangari [6] that aid intervention facilitates the hiring of workers in a farmers production farms. It means that interventions of FOs have reinforced the financial capacities of the beneficiaries. It could be inferred from this that the contribution of FOs on the acquisition of labourers was positive.

Contribution on the gross margins of respondents: This section presents the contribution of FOs on the mean annual farm income and gross margins of the value chains carried out by FOs organizations in their areas of

intervention such as market gardening, broilers and piggery using the parametric student (t) test.

Contribution on mean annual farm gross margins for marketing gardening: This section presents the mean annual farm income and gross margins of respondents from the parametric t-test and shown in Tables 5 and 6. The results from Tables 5 and 6 reveal that the beneficiary respondents mean annual farm income (361,363) is higher than that of non beneficiaries (126,250). The independent-Samples Levene's Test for equality of variances showed a statistically significant difference ($P=0.0001$) which is far less than 0.05) at 5% level in the improved mean annual farm income of beneficiary.

Table 2. Opinion of respondents on their incomes from January-December

Category of beneficiary	Sex	Increased (%)	Constant (%)	Decreased (%)
Beneficiary	Male	76 (27.14%)	8(2.85%)	8 (2.85%)
	Female	60 (21.42%)	8(2.85%)	0 (0%)
	Total	136(48.57%)	16 (5.71)	8 (2.85)
Non beneficiary	Male	24 (8.57%)	28 (10.00%)	16 (5.71%)
	Female	8 (2.85%)	20(7.14%)	24 (8.57%)
	Total	32 (11.42%)	48(17.14%)	40 (14.28%)

Table 3. Main equipments possessed by respondents in their farm

Category	Source of aid	Sprayer	Truck	Engine pump	Wheel barrow	incubator	Total
Beneficiaries	SOS Faim/EC	28(10.0%)	8(2.8%)	12(4.2%)	4(1.4%)	0(0%)	52(18.5%)
	MINADER	20(7.1%)	4(1.4%)	4(1.4%)	4(1.4%)	0(0%)	28(10.0%)
	ACEFA	32(11%)	8(2.8%)	8(2.8%)	0(0%)	4(1.4 %)	52(18.5%)
	Own capital	12(4.2%)	4(1.4%)	4(1.4%)	4(1.4%)	0(0%)	24(8.5%)
	Total	92(32.8%)	24(8.5%)	28(10.0%)	12(4.2%)		160(57.1%)
Non Beneficiaries	MINADER	12(4.2%)	4(1.4%)	0(0%)	4(1.4%)	0(0%)	20(7.1%)
	Own capital	84(30.0%)	12(4.2)	0(0%)	4(1.4%)	0(0%)	100(35.7%)
	Total	96(34.2%)	16(5.7%)	0(0%)	8(2.8%)	0(0%)	120(42.8%)

Table 4. Source of labour

Category of beneficiaries	Hired labour(%)	Family relatives (%)	Alone (%)	Total
Beneficiary	84(30.0%)	40(14.2%)	36(12.8%)	160(57.1%)
Non-beneficiary	36(12.8%)	72(25.7%)	12(4.2%)	120(42.8%)
Total	120(42.8%)	112(40.0%)	48(17.1%)	280 (100%)

Table 5. Distribution of T-test group statistics for annual farm income and gross margins for market gardening

	Category of beneficiary following type of intervention	N	Mean	Std. deviation	Std. error mean
Gardening	Beneficiaries	44	263863	42369	6387
Gross Margin	Non Beneficiaries	48	78458	16816	2427
Gardening	Beneficiaries	44	361363	32031	4828
Total Revenue	Non Beneficiaries	48	126250	17397	2511

Table 6. Independent samples T-test group statistics for annual farm income and gross margin of respondents

		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
									Lower	Upper
Market gardening Gross Margin	Equal variances assumed	51.324	.000	28.016	90	.0001	1.85405E5	6617.80908	1.72258E5	1.98553E5
Market gardening Total Revenue	Equal variances assumed	27.139	.000	44.244	90	.0001	2.35114E5	5313.99030	2.24556E5	2.45671E5

Table 7. Distribution of T-Test Group statistics for annual farm income and gross margin of respondents

Category of beneficiary following type of intervention		N	Mean	Std. deviation	Std. error mean
Poultry Gross Margin	Beneficiaries	64	357343	84571	10571
	Non Beneficiaries	12	91666	12309	3553
Poultry Annual Revenue	Beneficiaries	64	607500	1.3	16478
	Non Beneficiaries	12	280000	23354	6741

Table 8. Independent samples t-test group statistics for annual gross margin of respondents

		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
									Lower	Upper
Poultry Gross Margin	Equal variances assumed	3.845	.054	10.803	74	.0001	2.65	24592	2.16	3.14
Poultry Annual Revenue	Equal variances assumed	7.624	.007	8.536	74	.0001	3.27	38367	2.51	4.03

Table 9. Distribution of t-test group statistics for annual farm income and gross margin of respondents

	Category of beneficiary following type of intervention	N	Mean	Std. deviation	Std. error mean
Pig Gross Margin	Beneficiaries	52	64615.3846	27615.10942	3829.52665
	Non Beneficiaries	60	40000.0000	.00000	.00000
Pig Revenue	Beneficiaries	52	308076.9231	47446.08753	6579.58852
	Non Beneficiaries	60	279500.0000	29266.45561	3778.28317

Table 10. Independent samples t-test group statistics for annual farm income and gross margin of respondents

		Levene's test for equality of variances		t-test for equality of means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
									Lower	Upper
Pig gross margin	Equal variances assumed	915.985	.000	6.909	110	.0001	24615	3562	17555	31675
Pig revenue	Equal variances assumed	8.462	.004	3.890	110	.0001	28576	7345	14019	43134

The P-values is less than 0.05 or significant at 0.0001 thus there is difference between the means (beneficiary and non-beneficiary) have unequal means. This indicates that beneficiary respondents have a significantly higher mean annual farm income compared to the non beneficiary respondents. Tables 5 and 6 also show that the beneficiary respondents mean annual gross margin for market gardening (263,863) is higher than that of non beneficiaries (126,250). The independent-Samples Levene's Test for equality of variances showed a statistically significant difference ($P=0.0001$) which is far less than 0.05) at 5% level in the improved mean annual gross margin of beneficiary. The P-values (0.0001) is less than 0.05 or significant at 0.0001 thus there is difference between the means (beneficiary and non-beneficiary). This indicates that beneficiary respondents have a significantly higher mean annual gross margin compared to the non beneficiary respondents. This could be explained by their access to external aid which has helped them to improve access to productive resources, training and access to market outlet. These findings agrees with those of Aryeetey [15] who reported that aid channeled through FOs empower farmers to have a positive change in their incomes.

Contribution on mean annual gross margin for poultry: These sections present the mean annual farm income and gross margin of respondents from the parametric t-test results which are depicted in Tables 7 and 8.

Results from Tables 8 and 9 show that the beneficiary respondents mean annual farm income (607,500) is higher than that of non beneficiaries (280,000). The independent-Samples Levene's Test for equality of variances showed a statistically significant difference ($P=0.0001$) which is far less than 0.05) at 5% level in the improved mean annual farm income of beneficiary. The P-values is less than 0.05 or significant at 0.0001 thus there is difference between the means (beneficiary and non-beneficiary), that is having, unequal means.

This indicates that beneficiary respondents have a significantly higher mean annual farm income compared to the non beneficiary respondents. Tables 7 and 8 reveal that the beneficiary respondents mean annual gross margin (357,343) is higher than that of non-beneficiaries (91,666). The independent-Samples Levene's Test for equality of variances showed a

statistically significant difference ($P=0.0001$) which is far less than 0.05) at 5% level in the improved mean annual gross margin of beneficiary for poultry. The P-values (0.0001) is less than 0.05 or significant at 0.0001 thus there is difference between the means or the two groups (beneficiary and non-beneficiary). This indicates that beneficiary respondents have a significantly higher mean annual gross margin compared to the non beneficiary respondents. This could be explained by their access to aid which has helped them to improve access to productive resources, training and market outlet. These findings fits the conclusions of Maria *et al.* [17] who reported that aid assist farmers to boost their farm incomes.

Contribution on mean annual gross margin for piggery: This section presents the average or mean annual farm income and gross margin of respondents from the parametric t-test and show in Tables 9 and 10.

Results from Tables 9 and 10 show that the beneficiary respondents mean annual farm income (308,076) is higher than that of non beneficiaries (279,500). The independent-Samples Levene's Test for equality of variances showed a statistically significant difference ($P=0.0001$) which is far less than 0.05) at 5% level in the improved mean annual farm income of beneficiary. The P-values is less than 0.05 or significant at 0.0001 thus there is difference between the means (beneficiary and non-beneficiary) have unequal means. This indicates that beneficiary respondents have a significantly higher mean annual farm income compared to the non beneficiary respondents.

Tables 9 and 10 reveal that the beneficiary respondents mean annual gross margin (64,615) is higher than that of non beneficiaries (40,000). The independent-Samples Levene's Test for equality of variances showed a statistically significant difference ($P=0.0001$) which is far less than 0.05) at 5% level in the improved mean annual gross margin of beneficiary for poultry. The P-values (0.0001) is less than 0.05 or significant at 0.0001 thus there is difference between the means or the two groups (beneficiary and non-beneficiary). This indicates that beneficiary respondents have a significantly higher mean annual gross margin compared to the non beneficiary respondents. This could be explained by their access to external aid which has helped them to improve access to productive resources, training and market outlet. These

findings conform with Nshom's [16] and Maria, et al. [17] findings which reported that aid help farmers to improve in their farm incomes.

5. CONCLUSION

Farmers' organizations play a vital role in reinforcement of the economic capacities of farmers. This study carried out from January 2018 to March 2019 in Mezam Division-Cameroon was therefore aimed at analyzing the role of farmers' organizations (FOs) in the strengthening of the economic capacities of farmers. Following the findings from the study, it can be concluded that beneficiary FOs members access more than is the case with non beneficiary members. The contribution on the financial capacities of farmers was overall positive as 48.57% and 47% of the beneficiary farmers respectively had a statistically significant higher income than non beneficiaries. This study concluded that farmers' organizations are important for farmers in the development of the economic capacities of farmers.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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