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The impact of small ruminant funded projects on the socio-economic development of the producers: Case of some selected common initiative groups in the Far North Region, Cameroon

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Cameroon has enormous potentials for small ruminant production which are still largely underexploited. The Far North Region harbors about 3/4 of the total population of small ruminants (goat and sheep) in the country. Above 80% of the region's population is involved in livestock rearing. Despite these potentials, the sustained challenges in the sector have been attributed to low investment in the sector. Production rate is low and does not meet up with the meat demands of an ever increasing population. To resolve this problem a number of projects have been put in place by the government and non-governmental organizations (NGOs) to work through the intermediary of common initiative groups to boost the production of livestock especially that of small ruminants. This work was carried out to examine how two of such livestock projects funded by two NGOs, Heifer International Project Cameroon (HPIC) and Comité Diocésain de Développement (CDD) in the Far North Region were managed and its effects on the quality of life of the producers. A case study was carried out on 200 producers organized in 17 common initiative groups. The result of the survey was analyzed using SPSS 20.0 English Version and the hypotheses tested using the Spearman's Rank Correlation. The results obtained from the field revealed that 90, 97.5, and 98% of the producers witnessed an increase in livestock production, revenue and satisfaction of social needs after assistance respectively. It is concluded that the proper management of small ruminant livestock projects through the intermediary of common initiative groups has a significant and positive impact on the quantity of livestock production and socio-economic development of producers. Other projects aimed at increasing livestock production could follow the management styles of HPIC and CDD.

Key words: Management, socio-economic development, livestock projects, capacity building, inputs, monitoring, control.

INTRODUCTION

Cameroon's agriculture is the backbone of its economy, because it employs up to 70% of its workforce and contributes to 42% of its gross domestic product (GDP),

about 30% of its export revenue as well as 22.7 of its added value (World Bank report, 2014). 36.6% of the population is involved in agriculture with 21.6% of

Cameroon's population depending entirely on the livestock sector for a living (Annuaire Statistique du Cameroun, 2015; African Statistical Yearbook, 2016). According to the 2015 National Statistics Book of Cameroon, the contribution of the livestock sector to its GDP in 2013 was estimated at 398.4 billion FCFA. In 2014, the primary sector achieved high levels of growth owing to the agro pastoral potential of the country while growth in the animal husbandry subsector was estimated at 4.3%. All these three factors show that the contribution of the livestock sub-sector in the Cameroonian economy cannot be under estimated (Country Profile-Cameroon, 2015).

The country has enormous pastoral potentials for small ruminant production which are still largely underexploited. The Far North Region is the leading producer of most livestock species in Cameroon. For example, in 2012, the region produced about 361466 (68.6%) goats out of the national total of 529,643; 1,214,521 (74.0%) sheep out of the national value of 1,642,297 heads. In addition, the two Northern Regions (Far North and North) harbors about 3/4 of the total population of small ruminants (goat and sheep) (MINEPIA, 2013).

The sustainable availability of livestock product is preoccupying for the whole country due to the actual production performance which is low. In 2015, Cameroon witnessed an overall decrease in the production of meat by 4.8% compared to its production in 2012. This was attributed to a decrease in the production of meat from small ruminants and pork. This is evident from the fact that there was a decrease in the number of goats and sheep produced in Cameroon from 529643 and 1642297 in 2012 to 235731 and 735278 in 2013, respectively (Annuaire Statistique du Cameroun, 2015). Data on the consumption of different sources of animal protein provided by World Bank (2014) indicate that the consumption of animal protein per inhabitant per year is 14 g/inhab/day and protein intake including fish and others is 36 kg/inhab/year in Cameroon. This is below the normal recommended requirement of the FAO (2014) for a good diet, of 42 kg/inhab/year.

Also, the population size of Cameroon has been increasing rapidly and stands about 23,344,000 (African Statistical Year Book, 2015). Like most African countries, rapid growth in population, changes consumption patterns with more animal products being consumed. The change in consumption demand is creating new marketing options as witnessed by the growth in the number of supermarkets in Africa (Beyene, 2014; NEPAD, 2013). In addition, empirical verifications in the Far North Region have shown that due to increase demand, the price of meat has increased steadily (330%) from 750 FCFA in the 1980s to about 2500 FCFA in 2016. If beef has to

remain the principal source of protein, its production has to double. This may constitute a potential problem in the future due to the present low levels of production. As such, there is need to diversify production of livestock type to short production cycle animals such as small ruminants in a sustainable manner so as to meet up with expected future demands.

In Cameroon, the actual production of small ruminant livestock in 2013 is estimated at 9,250,683 heads and is projected to reach 30 million in the year 2020 (MINEPIA, 2013). It may be difficult to attain this objective due to the multiple constraints witnessed by this sub-sector such as low investments and lack of motivation. For instance, the percentage of total government expenditure in agriculture in 2014 stood only at 6.6% even though agriculture is the back bone of the economy as it makes a contribution of 42% to its GDP (Africa Agriculture Status Report, 2016). Like in most developing countries, the major constraints to this sector include low access to long and short-term loans through the absence of a specialized financing structure such as agricultural banks for investment in agricultural activities. This coupled with the lack of adequate equipment, veterinary dispensaries and clinics, extension follow up services and other inputs like veterinary drugs, animal feed and pasture slows down the production of livestock (Annuaire Statistique du Cameroun, 2015; Achancho, 2013; Baah et al., 2012). Equally, it has been demonstrated that inadequate policies were at the heart of disappointing performance of agricultural in general and the livestock sector in particular. It seems evident that the implications of the measures cited earlier will boost the production of livestock especially small ruminants if managed properly.

Given the high proportions of the population (over 80%) of the Far North Region involved in livestock production, the question has been what can be done to boost its production in the region? To remedy the situation, a number of projects have been put in place by the government and non-governmental organizations (NGOs) working together with common initiative groups in the Far North Region. The major aim of these projects has been to boost the production of livestock and especially small ruminants and consequently reduce hunger and poverty (socio-economic development) of the rural population through the production and sale of these livestock produce.

Despite these measures and coupled with its production potentials, livestock production in the area seem not to have witnessed a substantial increase in the region. It is therefore necessary to examine how such livestock projects have been implemented or managed to increase production of livestock and how it may have contributed to the socio economic development of the population.

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The understanding of the livestock sector in general and project implementation and management in particular will lay a frame work for boosting production in the livestock sector in the Far North in particular and Cameroon as a whole.

To carry out this work, two NGOs working with Common Initiative Groups (CIGs) to increase production and improve the living conditions of the population were identified. These NGOs are Heifer Project International Cameroon (HPIC) and Comité Diocésain de Développement (CDD) who assisted the farmers with both material and capacity building for the production of small ruminants in localities of Mokong and Meri.

The main problem to examine in this work was to understand the management of livestock projects through common initiative groups in the selected communities Meri and Mokong and its effects on the socioeconomic development of the producers.

To achieve this, the following research questions were formulated: Does the management of livestock projects in relation to increase production influence the socio-economic development of producers? Specifically three questions were asked to know if:

- (1) Does the provision of finance and use of inputs given to producer's influences livestock production and socio-economic development of producers?
- (2) Does the provision of capacity building to producers and the community influence livestock production and socio-economic development of producers?
- (3) Does the monitoring and control given to producers' influences livestock production and socio-economic development of producers?

Study objectives

The principal objective was to study the relationship that exists between the management of livestock projects by common initiative groups, livestock production and the socio-economic development of the producers.

Specifically, we seek to verify the relationship between: (1) The provision and use of finance and inputs given to producers, livestock production and the socio-economic development of producers; (2) The provision of capacity building to producers and the community, livestock production and the socio-economic development of producers; (3) Monitoring and control of producers, livestock production and the socio-economic development of produce.

Hypothesis studied

The general hypothesis of this work was that the proper management of livestock projects by common initiative

groups influences livestock production and the socio-economic development of the producers.

Specifically, (1) the provision and use of finance and inputs given to producers' significantly influences livestock production and socio-economic development of producers; (2) the provision of capacity building to producers and the community significantly influences livestock production and socio-economic development of producers; (3) monitoring and control given to producers' significantly influences livestock production and socio-economic development of producers

MATERIALS AND METHODS

This work was carried out in the Meri and Mokong localities in the Diamarre and Mayo Tshanaga Divisions, respectively in the Far North Region of Cameroon. These localities were chosen because HPIC and CDD had financed some projects on the production and sale of small ruminant production through the collaboration of local common initiative groups.

Data collection

The sampling technique used in this work is that of selective sampling. This is because the identified target population was constituted by members of common initiative groups who practice livestock farming in Meri and Mokong villages and had at least benefited from assistance from an NGO. From amongst these selected CIGs, 200 farmers involved in the rearing and sale of goat and sheep were randomly chosen and interviewed.

Thus, $n=200$ for $\alpha=0.05\%$, n which represent the population size and α = error margin.

Data analysis

After data collection from the field, counting was done by calculating the positive, negative and neutral responses for each case and the statistical test done using Spearman's and Pearson's test, which is given by:

$$r = 1 - \frac{6 \sum D^2}{n(n^2 - 1)}$$

where r represents Spearman's coefficient, D is the difference between the two variables studied and n the sample size. For example, livestock production and inputs received by farmers and $n = 200$, $r = 0$ which is the null hypothesis accepted and alternative hypothesis rejected; $r \neq 0$ which is the null hypothesis is rejected and the alternative hypothesis is accepted.

Inferential analyses and verification of hypothesis

Inferential analysis is a method, which consists of providing or getting information on the link or relationship that exists between variables. In our work, we made use of the Spearman's Rank Correlation table. Inference or judgment is established bases on the Spearman's Coefficient Testing of research hypothesis.

Step 1: Formulation of statistical hypotheses.

Ho: The null hypothesis (there is no existing significant link or relationship between the studied phenomena). This hypothesis is accepted when r is equal to zero.

Ha: The alternative hypothesis (there is a relationship between the studied phenomenon). This hypothesis is accepted when r is different from zero.

When Ho is accepted, we reject Ha and when Ha is accepted, we reject Ho.

Step 2: Determination of the significance rate, which is the error margin. The rate used in our work is 0.005.

Step 3: Calculation of the Spearman's Rank Correlation.

Step 4: Comparison.

Step 5: Conclusion.

Variables indicators

There are two types of variables used in this work; independent variable and dependent variable.

Independent variables

Independent variables are the variable that performs the action and it is this variable that the researcher tries to explain and measure its effects on the dependable variable. It also influences and determines the behavior of the subject studied. The following dependable variables were identified in this work.

Hypothesis independent variable

HR 1: The provision and adequate use of finances and inputs given to assisted farmers.

HR 2: The provision of capacity building to assisted farmers and the community.

HR 3: Monitoring and control of assisted farmers.

Dependable variable

This variable responds to the action of manipulating the independent variable. In this work, the dependable variables are "livestock production and socio economic development of producers".

Indicators

Indicators are defined as visible elements through which one can identify or measure variables. An indicator is a set of operational and quantifiable data that enables a researcher to gather information from the field. It can also be defined as something that helps to understand where we are, where we are going and how far we are from the goal. Indicators used in this work include type of inputs, nature of inputs, form of assistance, and provision of personal inputs for hypotheses one. Types of trainings received, practice of this trainings and participation of community in trainings for hypothesis two. Existence of vets, mortality level of animals, visits of development agent and livestock committees to producers

for hypotheses three.

RESULTS AND DISCUSSION

Descriptive field results

These studies revealed that a majority of the producers are women (83%) between the ages of 36 and 40 years; 99% of these farmers practice mixed farming and most of them are not educated (83.5%).

These studies also revealed that 90% of the producers who were supported witnessed some increase in livestock production after assistance. About half of producers (106) 53% confirmed to have had at least 10 after 3 years from 04 animals received at the beginning of the initial assistance phase. 97.5% have been able to increase their revenue after assistance and 98% of the producers (196) were able to cover their social needs such as feeding, family health, educational need of the children, amelioration of housing conditions, clothing, and yearly savings.

Results of impact of livestock project on animal production and socio economic developments

These results were obtained by verifying if each hypothesis postulated in this research was founded or not. This was done with the help of cross table analysis using SPSS and Spearman's correlation.

Verification of hypothesis No. 1

Research hypothesis No. 1: The provision and use of finance and inputs given to producers' significantly influences livestock production and socio-economic development of producers.

Null hypothesis (Ho): There is no correlation between the provision and use of finance and inputs given to producers, livestock production and socio-economic development of producers.

Alternate hypothesis (Ha): There is a correlation between the provision and use of finance and inputs given to producers, livestock production and socio-economic development of producers.

To verify hypothesis one, we used two indicators out of the four which enabled us to best explain and draw the necessary conclusions. These indicators included type of inputs given to farmers as assistance and nature of inputs given to farmers. These two indicators were crossed separately with the two depend variables, that is,

Table 1. Symmetric measures between levels of animal production after assistant and type of assistance.

Indicators		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by interval	Pearson's R	0.301	0.050	4.437	0.000 ^c
Ordinal by ordinal	Spearman's correlation	0.339	0.052	5.065	0.000 ^c
Number of valid cases		200			

Table 2. Symmetric measures of the level of social needs met * type of assistance.

Indicators		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by interval	Pearson's R	-0.150	0.073	-2.139	0.034 ^c
Ordinal by ordinal	Spearman Correlation	-0.211	0.067	-3.032	0.003 ^c
Number of valid cases		200	-	-	-

Table 3. Summary of hypothesis one and Spearman's correlation.

Indicators	Cross tables	Spearman's correlation calculated	Conclusions
Type of inputs received as assistance	Level of animal production after assistance * Type of assistance	0.339	Ha accepted
	Level of social needs met after assistance * Type of assistance	-0.211	
Nature of assistance	Level of animal production after assistance * nature of assistance	0.247	Ha accepted
	level of social needs met * nature of assistance	-0.263	
General conclusion	Hypotheses one accepted		-

level of production and socioeconomic development (Tables 1 and 2).

The results of these crossing show a Spearman's rank correlation different from zero. Consequently, the null hypothesis (Ho) which stated that there was no link or correlation between the variables has been rejected and the alternative hypothesis (Ha) accepted (Table 3).

The results of the crossing for the level of production after assistance and the type of assistance and nature of inputs received during assistance are positive indicating that there are direct relationships or correlations between them. The implication here is that, for livestock production to increase significantly, there must be a corresponding increase in the quantity of production factors such as material and capacity building. These results are in line with those of the Cameroon National Institute of Statistics Report of 2015 on animal production which stated that the slowdown in production of livestock in the Cameroon especially in the Far North Region is attributed to the lack of finance (veterinary drugs, animal feed, and pasture)

and the existence of traditional production systems. These results reflect the reality on the field as most producers identified the lack of inputs as their major challenge to increase production. The provision of these inputs by the concerned NGO's was an evident factor to boost their production. However, the rate of correlation is only moderate from the expected high value. This can be explained by the fact that, with farmers assisted by Heifer Project International Cameroon (HPIC), to ensure sustainability of the project, farmers are supposed to honestly and sincerely practice the Pass on the Gift (POG) phenomenon. This entails that each farmer after receiving 04 animals as assistance must give back these 04 animals to another farmer in another group to ensure continuity. It was noticed in the field, most of the farmers did not give sincere answers on the real number of their animals, probably to avoid losing an animal through the POG practice.

The results of the cross tables between the levels of social needs met after assistance and type and nature of

Table 4. Symmetric Measures between the level of animal production and received trainings.

Indicators		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by interval	Pearson's R	-0.044	0.017	-0.615	0.539 ^c
Ordinal by ordinal	Spearman's correlation	-0.052	0.020	-0.731	0.466 ^c
Number of valid cases		200	-	-	-

Table 5. Symmetric measures between level of social needs met * received trainings.

Indicators		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by interval	Pearson's R	0.036	0.016	0.503	0.615 ^c
Ordinal by ordinal	Spearman's correlation	0.064	0.024	0.900	0.369 ^c
Number of valid cases		200	-	-	-

assistance shows an inverse relationship. This is because the level of social needs met is indirectly depended on this variable (type and nature of assistance), but livestock production directly depended on the type and nature of assistance.

Verification of hypothesis No. 2

Research hypothesis No 2: The provision of capacity building to producers and the community significantly influences livestock production and socio-economic development of the producers.

Null hypothesis (Ho): There is no correlation between the provision of capacity building to producers and the community, livestock production and socio-economic development of the producers.

Alternate hypothesis (Ha): There is a correlation between the provision of capacity building to producers and the community, livestock production and socio-economic development of the producers.

To verify hypothesis two, the indicator, trainings received, was used to evaluate its influence on livestock production and level of social needs met after assistance as shown in Tables 4 and 5.

From cross Tables 4 and 5, the results of the Spearman's correlations of the two indicators are between +1 and -1, that is, -0.052 and 0.064, respectively which are different from zero. As such, the null hypothesis Ho has been rejected and the alternative hypothesis Ha has been accepted. Thus, hypothesis number two was confirmed as shown in Table 6.

The cross table between level of animal production and trainings received indicate a Spearman's correlation of

-0.052 indicating a significant link between the two variables. These findings confirm Peter Drucker's theory on knowledge worker productivity of 1992 which stated that productivity can only increase if the knowledge of the workers is increased for continuous innovation. These results also go in line with the recommendations of a similar study carried out by Adams and Ohene-yankyera (2015) on Socio-economic Characteristics of Subsistent Small Ruminant Farmers in Three Regions of Northern Ghana. The studies stated that there is need to improve farmers' technical knowledge through trainings to farmers for increase production of small ruminants.

The Spearman's correlation for level of social needs met and trainings received is 0.064 and positive indicating a direct relationship between the levels of social needs met and trainings received indicating that agricultural yield will only increases if the capacity of farmers in terms of training in the agricultural sectors is improved.

Verification of hypothesis No. 3

Research hypothesis No. 3: Monitoring and control given to producers' influences livestock production and socio-economic development of producers.

Null hypothesis (Ho): There is no correlation between monitoring and control given to producers, livestock production and socio-economic development of producers.

Alternate hypothesis (Ha): There is a correlation between monitoring and control given to producers, livestock production and socio-economic development of producers.

Hypothesis three was verified using the indicator, the

Table 6. Summary of hypothesis two and Spearman's correlation.

Indicators	Cross tables	Spearman's correlation calculated	Conclusions
Received trainings	Level of animal production after assistance x Received trainings	-0.052	Ha accepted
	Level of social needs met after assistance x Received trainings	0.064	
Conclusion	Hypotheses two has been accepted		-

Table 7. Symmetric measures between the level of animal production and level of mortality of animals after visits of veterinary officers.

Indicators		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by interval	Pearson's R	-0.542	0.057	-9.086	0.000 ^c
Ordinal by ordinal	Spearman's correlation	-0.544	0.061	-9.121	0.000 ^c
Number of valid cases		200	-	-	-

Table 8. Symmetric measures between the level of social needs met and level of mortality of animals after visits of veterinary officers.

Indicators		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Interval by interval	Pearson's R	0.061	0.073	0.855	0.393 ^c
Ordinal by ordinal	Spearman's correlation	0.031	0.073	0.440	0.660 ^c
Number of valid cases		200	-	-	-

level of mortality of animals after the visits of livestock extension collaborators or veterinary doctors and its influence on livestock production and level of social needs met after assistance as subsequently shown.

The results of the Spearman's correlations for hypothesis three indicate that there are correlations between the variables. That is, the level of animal production after assistance and level of mortality of animals after veterinary visits (Table 7) level of social needs met after assistance and level of mortality of animals after veterinary visits (Table 8). This can be justified by the fact that the Spearman's correlations of -0.544 and 0.031 are different from zero. As such, the Ho hypothesis that there is no correlations between the variables have been rejected and the Ha hypothesis accepted that there are correlations between the variables; conclusively, hypothesis three is accepted as shown in Table 9.

These findings are in line with studies carried out by Chukwuma (2012) on socio-economic factors affecting access and utilization of veterinary services by small ruminant producers in Izzi Local Government area of Ebonyi State, Nigeria who concluded that animal health control services remain an important input support function for any livestock farmer, as high mortality

occasioned by diseases, are major constraints to livestock production as such increase livestock production will not be successful without any animal disease control by veterinary services to reduce mortality and this has a significant effect on poverty alleviation on the rural population.

The positive value between level of social needs met and level of mortality indicate that if production of livestock is high, this will enable farmers to be able to increase their income and take care of their needs as livestock are raised for income. This result is in agreement with the findings by Baah et al. (2012) who reported that financial motivation was a key in raising sheep and goats among urban households.

Conclusions

The main objective of this study was to investigate the relationship between the management of livestock projects by NGOS through the intermediary of common initiative groups, livestock production and the socio-economic development of the producers in the Far North Region of Cameroon. Management here entails the manner in which these projects were organized in terms

Table 9. Summary of hypothesis three and Spearman's correlation.

Indicators	Cross tables	Spearman's correlation calculated	Conclusions
Level of mortality of animals after vet visits	Level of animal production after assistance * Level of mortality of animals after vet visits	-0.544	Ha accepted
	Level of social needs met after assistance * Level of mortality of animals after vet visits	0.031	
Conclusion	Hypotheses three has been accepted		

of inputs and personnel management to attain the principal objective of increased production and ameliorated living conditions of the producers.

Based on the results obtained on the field, the objectives of this study were attained and it can be concluded that the appropriate management of livestock projects by NGOs, through the intermediary of common initiative groups has a significant and positive effect on livestock production and socio-economic development of producers when the finance and inputs put at the disposal of the farmers are appropriately put into use, the farmers receive capacity building and there is appropriate monitoring and control of the animals by all the stakeholders.

RECOMMENDATIONS

Based on the conclusions from the studies, the following recommendations were formulated.

To the NGOs

(1) The livestock sector is a fast income-generating sector, which can easily ameliorate the living conditions of the farmers. As such, any investment in such a sector in the Far North Region should first start with trainings in modern animal husbandry techniques accompanied with other social trainings to reinforce the capacity of the farmers, because according to our findings, 83% of them are illiterates.

(2) The provision of inputs to farmers in the form of credit and gifts is a very good practice and should be encouraged. This entails credit in the form of animals and revolving fund, which have to be passed on to other poor farmers by the CIGs.

(3) Much should equally be done in terms of monitoring and control to ensure effective pass on of these animals and recovery of the revolving fund for project sustainability. As noticed, most groups did not have more

drugs for prophylactic treatment of animals, which had to be purchased by this fund.

(4) The NGO's should carry out effective monitoring and control of the veterinary doctors put at the disposal of the farmers to ensure that they do their work. In addition, regular trainings have to be provided to them as some farmers complained of lack of experience by some.

Farmers

(1) The farmers who to benefit more in the process have to make effective use of all inputs and funds put at their disposal to maximize production.

(2) They should put into practice all instructions given to them during trainings as project staff confirmed that some farmers had low production because animals died due to carelessness.

The state

(1) The government has been accused of not financing enough the livestock sector. The state should enable the creation of an agricultural bank for farmers, where farmers can borrow money at low interest rate to invest in the sector. Especially for farmers who have not had the opportunity to be assisted.

(2) Put in place a policy to encourage the production of small ruminants (animals with short production cycle) so as to diversify consumption of animal protein from beef to others, which has longer reproduction cycle. This will enable production to meet up demand in terms of animal protein.

(3) The state should make accessible vaccines to farmers and intensify vaccination and sensitization campaigns on the importance of vaccination through the services of MINEPIA.

(4) The state should provide enough livestock technicians to work on the field as we noticed that the NGO's were using local veterinary doctors in some villages where

MINEPIA agents were absent. These technicians should also be ready to take over the relay for follow up of these groups after the NGO's have stopped assistance to ensure sustainability.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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